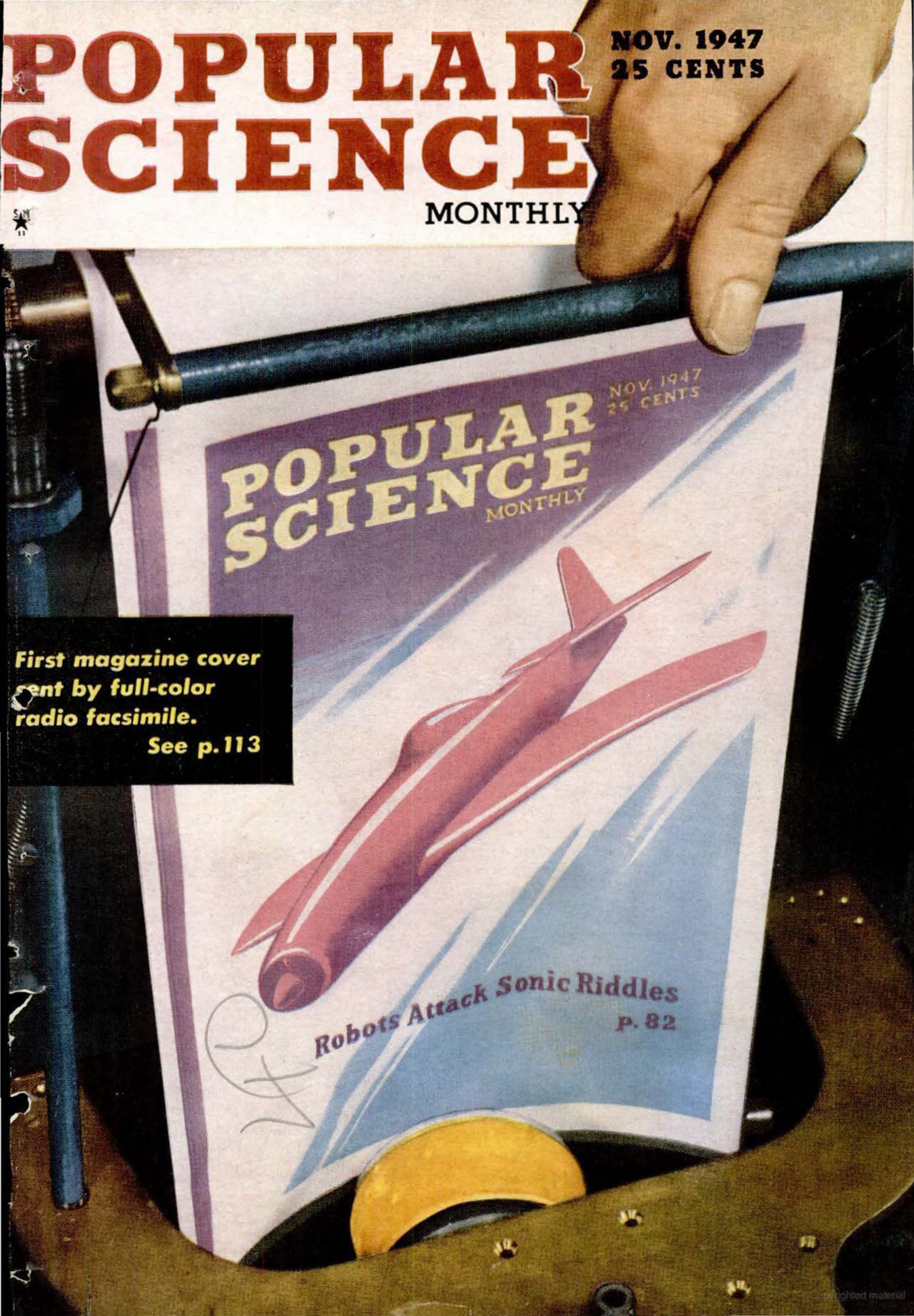
POPULAR SCIENCE MONTHLY

NOV. 1947
25 CENTS



First magazine cover sent by full-color radio facsimile.

See p. 113

Copyrighted material

Here's Easy High-Speed Self-Instruction in all 25 Useful Branches of

Mathematics

to help you qualify for a bigger, better job in America's expanding industries

Brought to You by 28 Leading Experts from Columbia, M.I.T., Cornell, Carnegie Tech., Georgia Tech., Many Others! A Practical Mathematics Course in Four Volumes! Used by Over 100,000 Men in Shop and Office!

CLIMAXING its achievements in adult education, the NATIONAL EDUCATIONAL ALLIANCE offers you—at amazingly low cost—a new streamlined Course in Mathematics especially designed to answer the thousands of urgent new calls for mathematically trained men in virtually EVERY field!

On work bench, in drafting room; in the laboratory; in tool, die and pattern making; in construction and engineering of all kinds, there's hardly a field where a mathematically trained man hasn't a decided advantage. He gets the better job—bigger pay—wins promotion more quickly—and enjoys greater security through all his earning years.

This New N. E. A. Course in Mathematics makes it possible for the average person to acquire—*in only a few months*—a practical working knowledge of all 25 branches of mathematics and their practical applications. It comes to you complete in four volumes filled with illustrated, fascinating lessons designed for home study.

You receive instruction from 28 foremost instructors chosen from outstanding universities. Each instructor has been selected because of his special knowledge of a particular branch of mathematics and because of his ability to simplify and streamline his instructions.

Four Volumes—Over 600 Helpful, Graphic Pictures and Diagrams; Nearly 1300 Pages!

No previous mathematics knowledge is needed under this ingenious teaching plan. You start with Basic Arithmetic and proceed by easy stages to an understanding of the most advanced branches of mathematics.

You'll learn how to use Algebra for short-cuts in daily shop problems, in construction work, in tool and die making, in welding, sheet metal work and pattern making, in office and laboratory. You'll learn how to apply Geometry in chemistry, mechanics, electricity and radio, in the drafting room. You'll learn how to employ Trigonometry in gearing, lathe centers, blueprints, die punches, etc.; in range finding, aviation, navigation. You'll learn how to utilize Calculus in the design and production of ships, dams, bridges, motors. You'll learn Practical Applications that you can use to win advancement and bigger pay.

(Continued on opposite page)

These Foremost University Experts Bring You Easy Mastery at Home of 25 Branches of Mathematics

For Use in Every Field

GENERAL EDITOR—R. S. Kimball, Ed. D. Formerly instructor at N. Y. U. Nationally famous organizer of courses in Mathematics for War Service.

Mass. Inst. Technology
Norbert Wiener, Ph.D. Vice-Pres. American Mathematical Society. Bocher Prize Winner.

Columbia Univ.
Edw. Kasner, Ph.D. Member, Committee on Mathematics National Research Council.

Carnegie Inst. Tech.
Lloyd Lyne Dines, Ph.D. Head of Dept. of Mathematics.

Rensselaer Poly Inst.
James McGiffert, C.E., Ph.D. Member, Editorial Board National Mathematics Magazine.

Princeton Univ.
Norman J. Sollenberger, M.A. in C.E. Asst. Prof. of Civil Eng. Head of Materials Testing Laboratories.

Fordham University
Walter A. Hynes, Sc.D. Assoc. Prof. of Analytic Chemistry.

Northwestern Univ.
David Raymond Curtiss, Ph.D. President, Mathematical Association of America.

Stevens Inst. Tech.
Robert Baker, B.S. Asst. Director War Industries Training School.

Cornell Univ.
Ralph P. Agnew, Ph.D. Head of Mathematics Dept.

Univ. of Chicago
Lawrence M. Graves, Ph.D. Professor of Mathematics.

Georgia School Tech.
Ralph A. Hefner, Ph.D. Professor of Mathematics.

University of Notre Dame
Karl Menger, Ph.D. Prof. of Mathematics. Vice-President International Congress of Mathematics.
Paul M. Pepper, Ph.D. Assoc. Prof. of Mathematics.

University of Ill.
O. K. Bower, Ph.D. Asst. Prof. of Mathematics.

Pratt Institute
Otis Benedict, Jr. Assoc. Prof. Machine Shop Practice.

Calif. Inst. of Tech.
William W. Michael, B.S. in C.E. Head of Dept. of Civil Engineering.
William H. Pickering, M.A. in E.E., Ph.D. Assoc. Prof. of Electrical Engineering.

U. S. Naval Academy
Sebastian B. Littauer, C.E., D. Sc. Formerly Instructor at Annapolis; Now on Engineering Staff, Bendix Radio.

R. C. A. Institutes
George F. Maedel, E.E. Chief Instructor N. Y. School of R.C.A. Institutes.

Univ. of Michigan
Carl H. Fischer, Ph.D.
C. J. Nesbitt, Ph.D. Asst. Prof. of Mathematics.

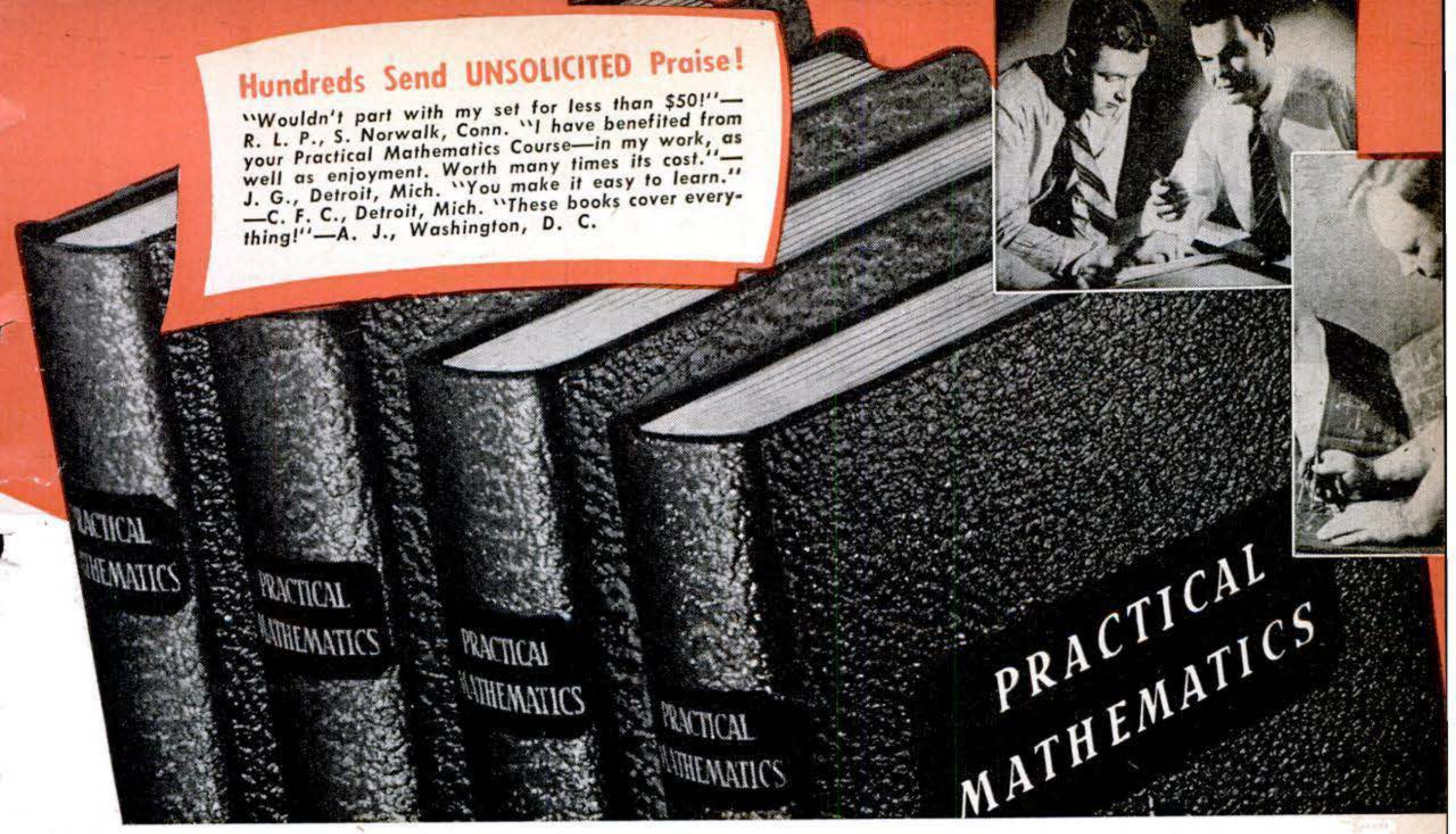
Univ. of Pennsylvania
Wharton School of Finance and Commerce.
Jeremiah Lockwood, Ph.D. Head of Accounting Dept.
Edward N. Wright, Ph.D. Assoc. Prof. of Accounting.
Oscar S. Nelson, Ph.D. Assoc. Prof. of Accounting.

Univ. of So. Calif.
Park J. Ewart, Ph.D. Head of Dept. of Finance.
Kenneth L. Trefftzs, Ph.D. Asst. Prof. of Finance.

Stanford Univ.
Vern James, Ph.D. Graduate School of Business.

Copyright by the National Educational Alliance, Inc.

MAIL THIS FREE-TRIAL FREE-GIFT COUPON



Hundreds Send UNSOLICITED Praise!

"Wouldn't part with my set for less than $50!"—R. L. P., S. Norwalk, Conn. "I have benefited from your Practical Mathematics Course—in my work, as well as enjoyment. Worth many times its cost."—J. G., Detroit, Mich. "You make it easy to learn."—C. F. C., Detroit, Mich. "These books cover everything!"—A. J., Washington, D. C.

FREE! even if you return the set! This Short-Cut to Easy Figuring!

Does the Work of a Slide Rule Faster, Easier and More Accurately! 160 pages!

This book of Logarithms is the greatest short-cut ever devised for quick and easy multiplying dividing and all other calculating. Easier to learn; gives answers quickly and far more accurately than any Slide Rule. A complete explanation of the use of logarithm tables is given. So simple you can grasp it and begin to apply it in a few minutes. Covers logs for all numbers to the 6th place; contains much additional information including a table of circular arcs. Invaluable for mechanics, scientists, businessmen, etc. **FREE** even if you return the Mathematics Library!

Here's a Brief Glimpse of Subjects in This Four Volume Mathematics Course

1. BASIC ARITHMETIC
Shop short-cuts, quick applications of addition, subtractions, etc.

2. ADVANCED ARITHMETIC
Percentages, fractions, ratio, rapid calculation.

3. BASIC ALGEBRA
Industrial and technical short-cuts; formulas, etc.

4. ADVANCED ALGEBRA
Practical use of simultaneous equations, graphs, etc.

5. PLANE GEOMETRY
How to measure angles, areas, distances, etc.

6. CONIC SECTIONS
Determining path of a shell, design of auto headlights, etc.

7. SOLID GEOMETRY
Interpreting blueprints, coordinate points in drawing, etc.

8. TRIGONOMETRY
Calculating distance; theodolites and sextants, Vernier scale, etc.

9. LOGARITHMS AND SLIDE RULE
Short-cut operations in engineering problems.

10. THE CALCULUS
Solves problems that can be solved in no other way.

11. DIFFERENTIAL EQUATIONS
Determining rate of disintegration of radio-active substances; population increase or decrease, etc.

12. MENSURATION
Measurement of angles; torque, density, tolerances, etc.

13. STRUCTURAL ENGINEERING
Producing a finished structure; stresses; equilibrium, etc.

14. MACHINE-SHOP PRACTICE
Computing cutting speeds for lathe, drill press, etc.

15. HEAT
Controlling heat, expansion, specific and latent heat, etc.

16. CHEMISTRY
Equations, decomposition, replacement, etc.

17. HISTORY OF MATHEMATICS
Pythagoras, Euclid, Archimedes, the genuises of today.

18. ELECTRICITY
Measurements; resistances; capacitance; time constants, etc.

19. MILITARY GUNNERY
Range-finding; direction; trajectory; variables, etc.

20. NAVIGATION AND AERIAL NAVIGATION
Plotting a course; Mercator chart, great-circle sailing, drift, etc.

21. RADIO AND TELEVISION
Amplifier stages, tank circuits, television and high frequency transmission, etc.

22. LIFE INSURANCE
Annuities; compound interest; mortality tables; dividends, etc.

23. ACCOUNTING
Debits and credits, discounts, sinking fund; profit and loss, etc.

24. FINANCE
Capital financing, chain discounts, bonds, etc.

25. BUSINESS STATISTICS
Business cycle, index numbers, flow-charts, etc.

THE ABOVE IS ONLY A SMALL FRACTION OF THE SUBJECTS COVERED!

Yours for FREE TRIAL

Normally, mathematical training as comprehensive as these 25-Courses-in-1 would cost you hundreds of dollars and years of study. Now you get it in these 4 volumes at a small fraction of the cost and time! Test this Course at our risk and expense. Mail coupon below—get the set for a week's FREE Examination. After a week you may return it and *owe nothing;* however, if you are thoroughly convinced that it can help you advance to bigger earnings, keep it at the incredible bargain price and easy terms shown in coupon. *But you must ACT NOW!* This edition is limited in quantity. There may not be enough to meet nation-wide demand. Avoid disappointment — mail Free-Trial Coupon **NOW!** National Educational Alliance, **37 W. 47th St., New York 19, N. Y.**

FREE-TRIAL AND GIFT COUPON

National Educational Alliance Inc.,
37 West 47th Street, New York 19, N. Y.

DO NOT WRITE IN BOXES

137

8011

Without obligation to me, ship me prepaid for a week's FREE examination the complete "PRACTICAL MATHEMATICS LIBRARY" in 4 volumes of 1280 pages. After one week's FREE TRIAL examination, I will either return the books and owe you nothing; or keep them and send you only $2 then and $2 a month until the bargain price of only $9.80, plus a few cents postage, is paid.

FREE GIFT!—Also ship me prepaid the 160-page book "6-PLACE LOGARITHMS" to keep entirely FREE *even if I return the set!*

SAVE COST OF 5 LB. SHIPMENT PLUS 30c CASH DISCOUNT. Send only $9.50 with this coupon as full payment. Same return privilege, full refund guaranteed.

MR.
MRS.
MISS _____ (Print plainly in block letters)

ADDRESS _____

CITY & ZONE No. _____ STATE _____

☐ Check here if you prefer to examine luxurious De Luxe **Edition** in Genuine Morocco-Grained flexible Artcraft, beautifully embossed. Only $1 per volume extra. Same terms.

Copyrighted material

FOUNDED 1872 VOL. 151: No. 5

POPULAR SCIENCE

Mechanics & Handicraft MONTHLY

REG. U. S. PAT. OFF.

EDITOR:
Perry Githens

MANAGING EDITORS: Fred O. Newman, Volta Torrey

ART EDITOR: Howard C. Jensen

HOME & WORKSHOP EDITOR:
Harry Walton

ASSOCIATE EDITORS: Alden P. Armagnac, Devon Francis, Robert Gorman, Hartley E. Howe, Herbert Johansen, Martin Mann, Frank Rowsome, Jr., John F. Stearns, R. P. Stevenson

WESTERN EDITOR: Andrew R. Boone (Los Angeles, Cal.)

ART DIRECTOR: Harry Samuels

ART ASSOCIATES: Herbert Anthony, Eric Karminski, Jr., Stewart Rouse, Frances Cooper (Production)

STAFF PHOTOGRAPHERS: W. W. Morris, Hubert Luckett, Robert F. Smith

EDITORIAL ASSISTANTS: Mae G. Dyer (Chief), Julia Charnif, Carol Ennis, Sheldon Gallager, Saverio Rada, Lillian Thalenfeld, Ruth Westphal

PUBLISHER:
Godfrey Hammond

NOVEMBER 1947

Cover: PSM Kodachrome of actual transmission by radio of color painting by Ray Pioch

Science News

Boys Build a Cyclotron....102
Chemicals Grow Crystals....108
Tune In a Painting....113
Turbines for Autos?....128
Steel Muscles Snub Train Bumps....138
Radar Calls the Weather....143

Science at Work

Punches Holes in Water.... 86
Mail-Order Isotopes.... 87
Rockets Outgrow Their Desert Range....120
Six Billion Soft Drinks a Day....122
Multitude Fed Without Soil....129
Typewriter Conquers Chinese Symbols..137
"Plow Proving Grounds" Tests Tools....144
Jets Are Jacks of Many Trades....151

PSM Features

Picture of the Month.... 81
Potent Push-Up.... 86
Gun Shoots Rail Holes.... 92
How Germans Build Mud Homes.... 93
Big Factories Start Small....106
Mirror Detects Flaws....108
Easing Trucker's Burden....111
Cub Tractor—Toy Version....112
Printing Photos Inside Glass....124
Toys and Ideas Fill Rumpus Room....132
Building a House an Hour....146
Sodium Carbonate Earns Its Salt....216

Aviation

Robots Dive into Speed's Mysteries.... 82
Tower Tests Rotors....100
Trailer Grows Wings....101
Analyzer Spots Engine Troubles Aloft....109

Automobiles

Baby Austins Grow Up.... 92
Auto Ideas....154
Rivetless Brake Linings....156
Curing Auto-Door Ailments....158
Gus Spots Double Trouble....160

Inventions

Climbing to the Rescue....111
New Ideas from the Inventors....118
I'd Like to See Them Make....131
Bricklaying Speeded Up....142

Photography

Water Power Agitates Tank....197
Checking the Focus of a Reflex....197
Homemade Speed Flash....198
Diffusers Snap On....202
Attachments for Copying....203

Mechanics & Shopcraft

Quick-Dry, Odorless Water Paint....110
Let Your Drill Press Do It....176
Drill Creates Novel Finishes....186
Jar Ring Clamps Polishing Pad....187
Cutter Bevels Irregular Edges....187

(CONTINUED ON PAGE 4)

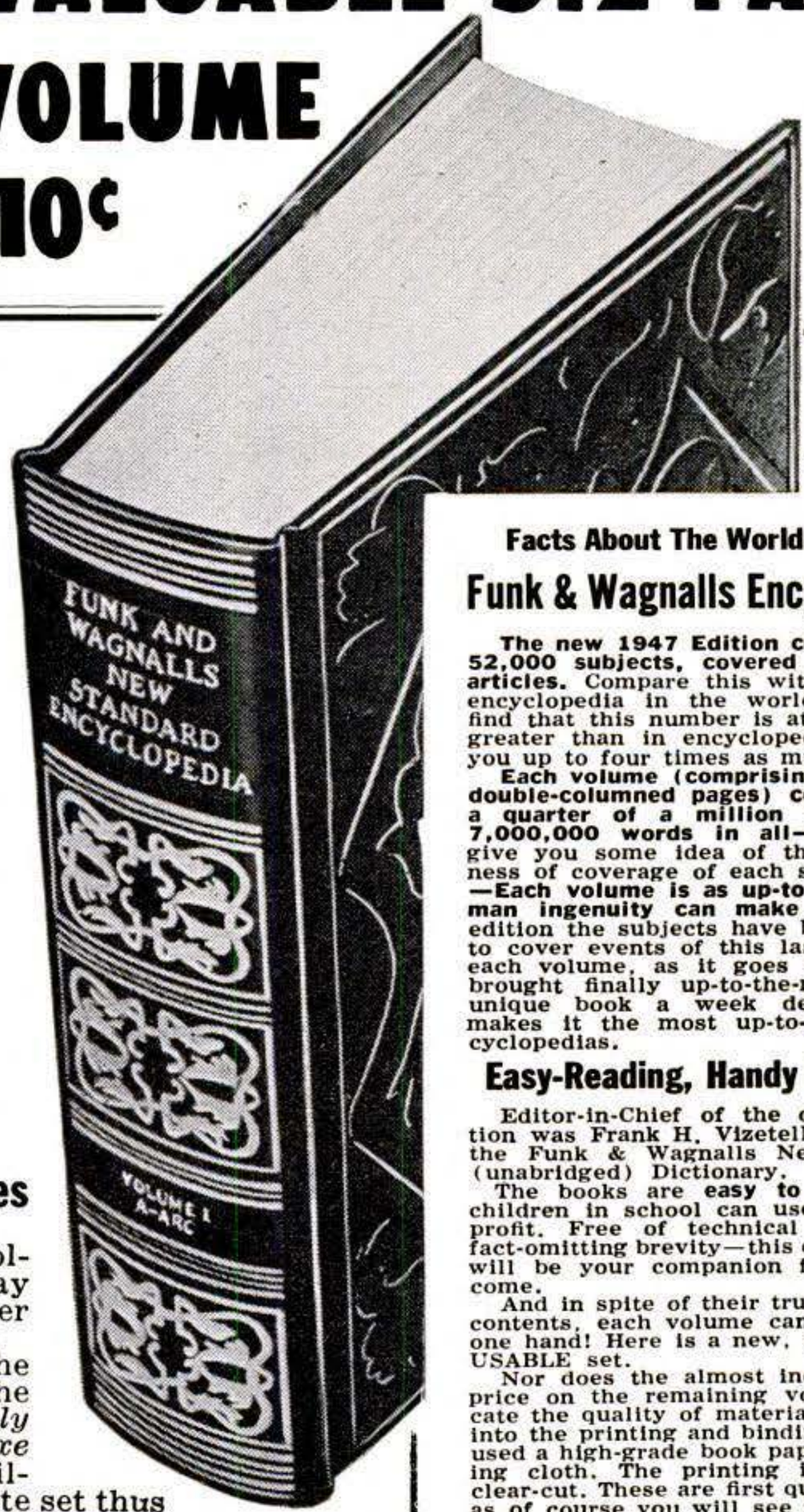
Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc. Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, at the Post Office at New York under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U. S. A. Copyright, 1947, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, $2.50; foreign countries, $3.50. Subscribers must notify us of change of address four weeks in advance of the next publication date. Be sure to give both old and new addresses, including zone numbers.

Copyrighted material

An Invitation to Readers of This Magazine

SEND FOR THIS VALUABLE 512-PAGE ENCYCLOPEDIA VOLUME

—IT'S YOURS FOR ONLY 10¢



WE ARE now on press with our new 1947 Edition of the Funk & Wagnalls New Standard Encyclopedia, which in previous editions sold over 15,000,000 volumes—an amazing record.

We have set aside 1,500 sets for readers of this magazine and now invite you to become the owner of a set—making this extraordinary offer to enable you to become acquainted with the volumes before you decide to buy.

We want to send you Volume I of the set with our compliments. Merely send us 10c to cover our mailing cost—more as evidence of your good faith than anything else. This volume is yours to keep without any further reservation on your part. If, after examining Volume I, you want the rest of the 27-volume set, you may receive it at a ridiculously low price through our book a week plan, explained later in this announcement. Or, if you want no further books, you merely drop us a postcard saying so, and that ends the matter.

Book a Week Plan for Balance of Volumes

The first few volumes are now on press. Volume I is delivered to you immediately. Two weeks later, unless you write us saying "No," the next two volumes are mailed to you. Two weeks after that the following two volumes are sent you, and so on. You thus receive your volumes, freshly off press, at the rate of a volume a week.

YOU DO NOT PAY FOR ANY BOOKS IN ADVANCE—We enclose a bill with each two volumes, which you pay within five days after receiving the books.

How much are the volumes? Here's the surprise. *You pay only $1.39 for the De Luxe Binding, plus 11c* mailing cost. The complete set thus costs you only a small fraction of what other high-grade encyclopedias cost you —and we want only the opportunity to *PROVE* to you that ours is unexcelled for your use.

A Choice of Editions

We offer you a choice between our De Luxe and our Library Edition.

The De Luxe Edition, at $1.39 per volume, is bound in dark blue, leather-grained cloth, stamped in red and gilt, as illustrated, with head and tail-bands, and harmoniously stained pagetops. End-papers and frontispieces are color reproductions of woodcuts by Hans Alexander Mueller, the frontispieces being a set of woodcut portraits of American Presidents.

The Library Edition costs slightly more ($1.89 per volume plus the same 11c mailing cost), and has all the features described above, plus a more expensive binding. The covers are in a tan linen-weave cloth, with red and black title panels, decorated with genuine 22 karat gold leaf—an extremely handsome and dignified set of books.

You have your choice of these editions in sending for Volume I, at the same 10c mailing cost. However, before indicating your choice of editions in the coupon at right, please remember the difference in price. And *hurry!* 1,500 sets are not many for a magazine of such large circulation as this one. First come, first served. Mail coupon NOW!

Copyright 1947, Unicorn Press

Facts About The World-Famous

Funk & Wagnalls Encyclopedia

The new 1947 Edition contains over 52,000 subjects, covered in separate articles. Compare this with any other encyclopedia in the world. You will find that this number is at least 30% greater than in encyclopedias costing you up to four times as much as ours.

Each volume (comprising about 500 double-columned pages) contains over a quarter of a million words—over 7,000,000 words in all—which will give you some idea of the completeness of coverage of each subject.

—Each volume is as up-to-date as human ingenuity can make it. In this edition the subjects have been revised to cover events of this last year, and each volume, as it goes to press, is brought finally up-to-the-minute. Our unique book a week delivery plan makes it the most up-to-date of encyclopedias.

Easy-Reading, Handy Volumes

Editor-in-Chief of the original edition was Frank H. Vizetelly, editor of the Funk & Wagnalls New Standard (unabridged) Dictionary.

The books are **easy to read!** Your children in school can use them with profit. Free of technical detail—and fact-omitting brevity—this encyclopedia will be your companion for years to come.

And in spite of their truly enormous contents, each volume can be held in one hand! Here is a new, streamlined, USABLE set.

Nor does the almost incredibly low price on the remaining volumes indicate the quality of materials that went into the printing and binding. We have used a high-grade book paper and binding cloth. The printing is crisp and clear-cut. These are first quality books, as of course you will see for yourself.

UNICORN PRESS, Authorized Publishers
Brooklyn 1, New York

I enclose 10c in coin or stamps, for which please send me Volume I of the new 1947 Funk & Wagnalls New Standard Encyclopedia in the edition checked below.

☐ DE LUXE ☐ LIBRARY

Please also reserve the balance of a set for me in the same edition.

If I decide to cancel the reservation after examining Volume I, I will write you saying so, and there will be no further obligation; otherwise you may send me two more volumes every two weeks, and I will pay within 5 days after receiving them, at the rate of $1.39 per volume plus 11c mailing cost for De Luxe Edition (or $1.89 per volume plus the same handling cost for Library Edition)—that is all!

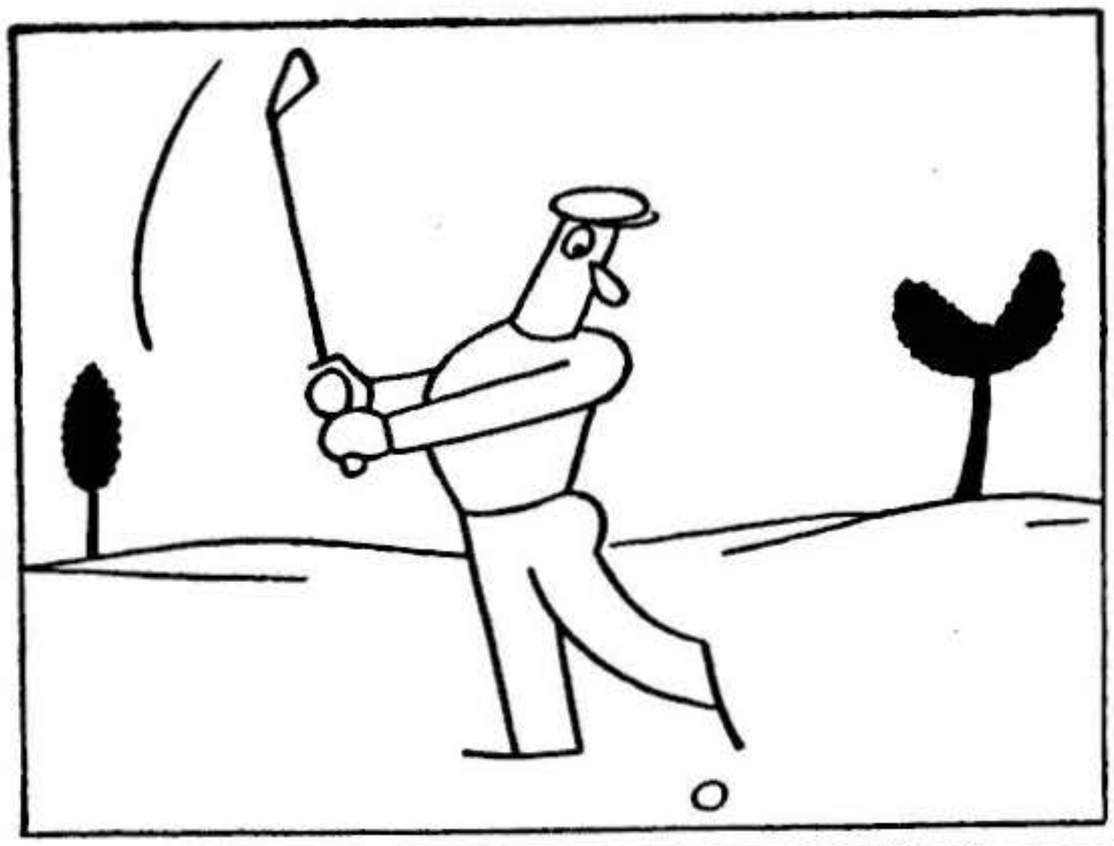
Volume I is mine to keep in any event.

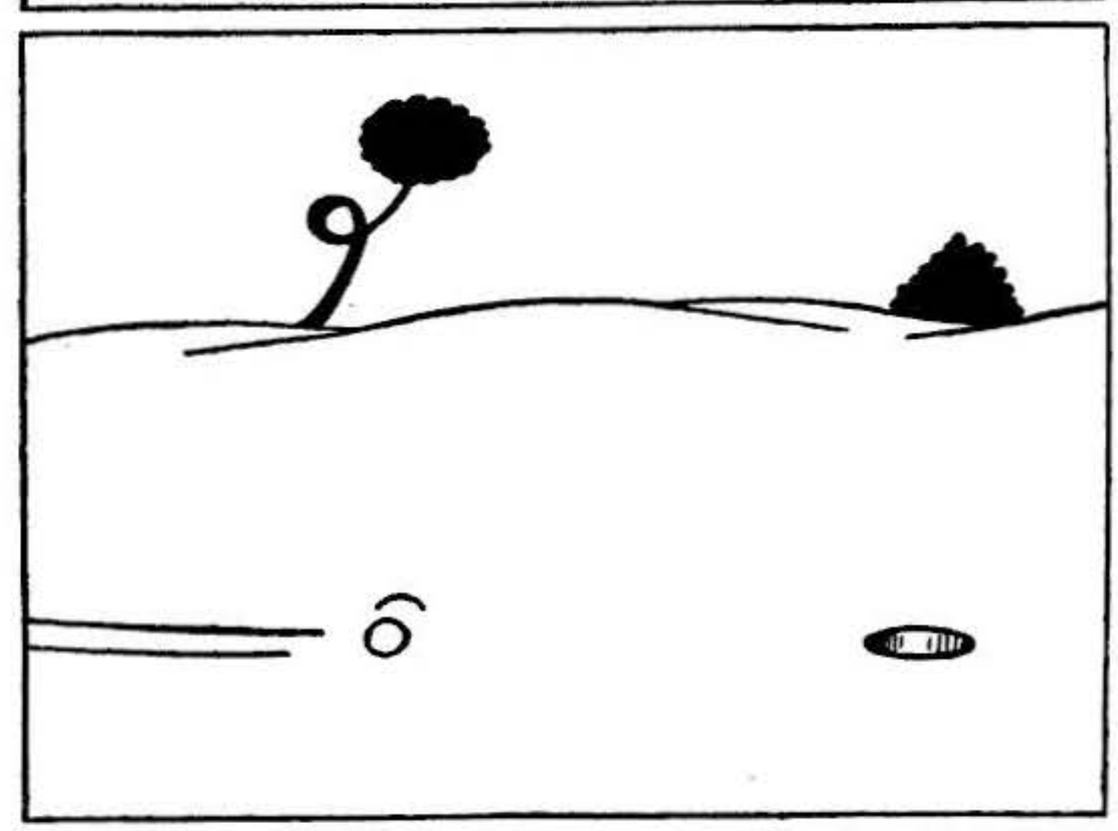
Name.....

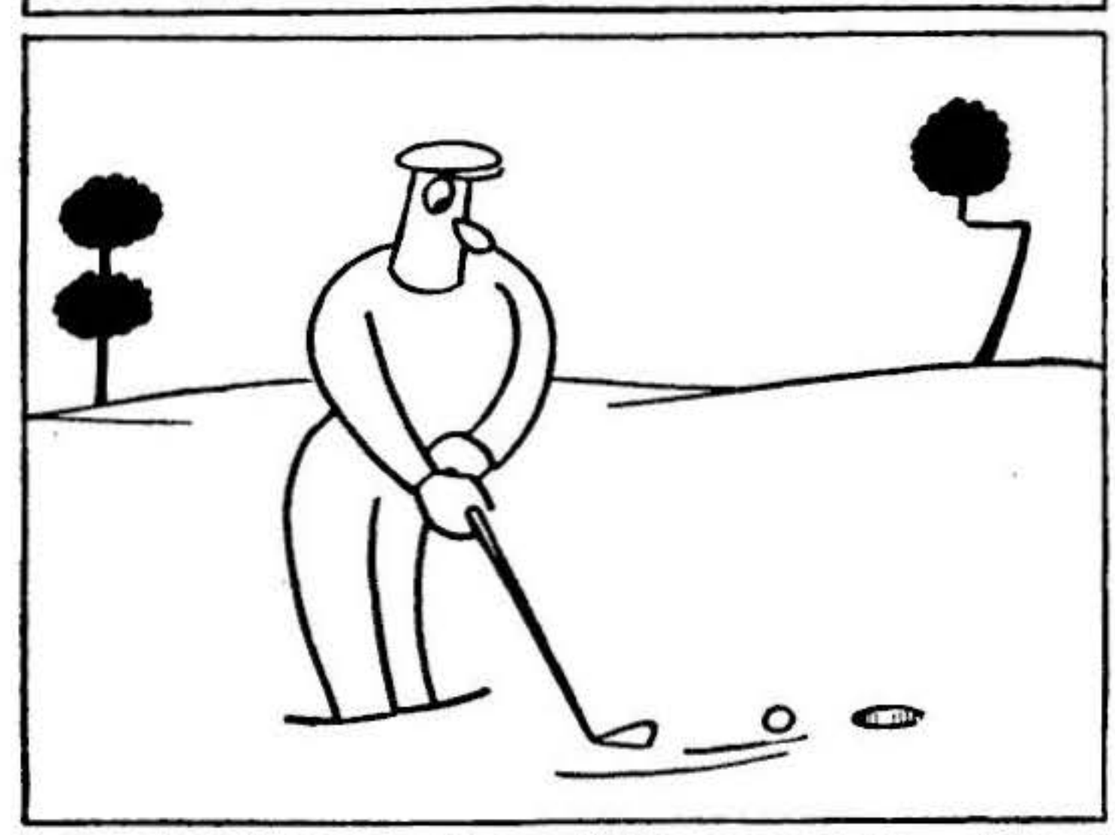
Address.....

City, Zone and State.....3105

Copyrighted material







New Shop Ideas....194
Bandsaw Blade Cuts Rubber....214
Gadgets Ease Plumber's Job....214
Jar Stores Composition Wood....220
Workbench Trough Is Handy....221

Home Mechanics & Handicraft

Craftwork Projects of the Month....136
Tray Hammered on Wood Form....164
Tuckaway Tables Fold Flat....166
Earring Tree Turned from Dural....168
Model Tank Packs a Wallop....169
Kite with Sails Soars in Breeze....170
Fisherman Rides Pull Toy....174
Lighted Yule Tree Decorates Door....175
Turned Bowl Makes Music....180
Three-Place Bobsled....181
Hand-Hammered Slave Bracelet....185
Table Mill Grinds Fresh Pepper....188
Sturdy Footstool Provides Comfort....189
Homemade Hilsch Tube....190
Swinging Door Always Closes....214
Phonograph Alarm Wakes Sleeper....215
Cupboard Has Disappearing Bin....220
Spring Keeps T-Square Square....221
Fan Heats Coal Range Quickly....221
Handy Nail-Polish Hints....222

Radio & Electricity

Antenna Stretches Tele.... 92
The Microwaves Are Coming!.... 94
Remote Control Speeds Rail Traffic....111
Signal Corps' New Tricks....134
Tiniest Tube for Wrist-Watch Radio....142
Building a Multimeter (Part 2)....204
News in Electronics....208
Boy's Radio Lets Dad Enjoy His....209
Simple Guard Protects Needle....210
Tags on Wires Save Time....210

Departments

Letters 16
Voice of Science....79A
Aids to Modern Living....152
What's Your Ingenuity Quotient?....179
Keeping the Home Shipshape....182
For Boats and Boating....184
New Tools 193
Hobby Shopping 196
Photo Ideas and Equipment....202
Craftsmen at Work....211
Home Experiments....212
What's Wrong?....215
For Easier Farming....224

Copyrighted material

DON'T READ ANOTHER WORD OF THIS ADVERTISEMENT

unless you're interested in a better job, a larger salary, greater responsibility! I. C. S. messages are not addressed to the idly curious—they're for the man who is curious with a purpose.

If you want to know how to start achieving advancement and success, we have important information for you.

We want to tell you that I. C. S. Courses covering more than 400 subjects are available for spare-time study at surprisingly low cost.

We want you to know that pay increases and job betterments are consistently reported to us by I. C. S. students in a volume as high as 600 and more letters a month.

Note, too, that successful I. C. S. graduates are numbered in the thousands and include presidents, production and research heads, superintendents, foremen in almost every branch of industry.

If you're truly curious, you'll want to know the details of what I. C. S. did for these men—and what it can do for you. The coupon brings you this full information. Mark and mail it *right now!*

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 7695-L, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Business and Academic Courses

☐ Accounting ☐ Advertising
☐ Arithmetic ☐ Bookkeeping
☐ Business Administration
☐ Business Correspondence
☐ Certified Public Accounting
☐ Commercial
☐ Commercial Art
☐ Cost Accounting
☐ Federal Tax
☐ First Year College
☐ Foremanship ☐ French
☐ Good English ☐ High School
☐ Higher Mathematics
☐ Motor Traffic ☐ Postal Service
☐ Salesmanship ☐ Secretarial
☐ Sign Lettering
☐ Spanish ☐ Stenography
☐ Traffic Management

Air Conditioning and Plumbing Courses

☐ Air Conditioning
☐ Heating ☐ Plumbing
☐ Refrigeration ☐ Steam Fitting

Chemistry Courses

☐ Chemical Engineering
☐ Chemistry, Analytical
☐ Chemistry, Industrial
☐ Chemistry, Mfg. Iron & Steel
☐ Petroleum Refining ☐ Plastics
☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses

☐ Architecture
☐ Architectural Drafting
☐ Building Estimating
☐ Civil Engineering ☐ Coal Mining
☐ Contracting and Building
☐ Highway Engineering
☐ Lumber Dealer
☐ Reading Structural Blueprints
☐ Sanitary Engineering
☐ Structural Drafting
☐ Structural Engineering
☐ Surveying and Mapping

Communications Courses

☐ Electronics
☐ Practical Telephony
☐ Radio, General
☐ Radio Operating
☐ Radio Servicing
☐ Telegraph Engineering

Electrical Courses

☐ Electrical Drafting
☐ Electrical Engineering
☐ Electric Light and Power
☐ Lighting Technician
☐ Practical Electrician
☐ Power House Electric
☐ Ship Electrician

Internal Combustion Engines Courses

☐ Auto Technician ☐ Aviation
☐ Diesel-Electric
☐ Diesel Engines ☐ Gas Engines

Mechanical Courses

☐ Aeronautical Engineer's, Jr.
☐ Aircraft Drafting
☐ Flight Engineer
☐ Forging ☐ Foundry Work
☐ Heat Treatment of Metals
☐ Industrial Engineering
☐ Industrial Metallurgy
☐ Machine Shop
☐ Machine Shop Inspection
☐ Mechanical Drafting
☐ Mechanical Engineering
☐ Mold-Loft Work
☐ Patternmaking—Wood, Metal
☐ Reading Shop Blueprints
☐ Sheet-Metal Drafting
☐ Sheet-Metal Worker
☐ Ship Drafting ☐ Ship Fitting
☐ Tool Designing ☐ Toolmaking
☐ Welding—Gas and Electric

Railroad Courses

☐ Air Brake ☐ Car Inspector
☐ Diesel Locomotive
☐ Locomotive Engineer
☐ Locomotive Fireman
☐ Railroad Section Foreman

Steam Engineering Courses

☐ Boilermaking
☐ Combustion Engineering
☐ Engine Running
☐ Marine Engineering
☐ Steam Electric ☐ Steam Engines

Textile Courses

☐ Cotton Manufacturing
☐ Rayon Weaving ☐ Textile Designing
☐ Woolen Manufacturing

Name_____ Home Address_____

City_____ State_____

Age_____ Present Position_____ Working Hours_____ A.M. to_____ P.M.

Special tuition rates to members of the Armed Forces.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Copyrighted material

YOUR TELEPHONE TRANSMITTER AND RECEIVER, *voice gateways to the telephone plant, are so essential to satisfactory service that they have been under study in Bell laboratories for seven decades.*

A TELEPHONE RECEIVER is a complex system of electrical and mechanical elements. Its coils, magnets, diaphragm and cap react on each other as they convert the electrical waves of your voice to sound waves. What is the best size for the holes in the ear cap? Will 1/1000th inch greater thickness help a receiver diaphragm to carry your telephone voice more clearly? One way to find out is to build numerous experimental receivers and test them.

But Bell Telephone Laboratories have found a shorter way. They built an all-electrical replica, an "equivalent circuit" in which electrical resistance stands for air friction in the cap holes; capacitance corresponds inversely to the stiffness of the diaphragm. Over-all performance of this circuit can be quickly measured and design changes economically explored. Later, a model can be built for final check.

The "equivalent circuit" was pioneered by Bell Telephone Laboratories 25 years ago. It is a useful tool in many Laboratories developments—saving time, saving the cost of machine-tooled models, encouraging experimentation. It is one more example of the way Bell scientists get down to fundamentals as telephone progress continues—and service keeps on improving for all subscribers.

BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

Copyrighted material

HOW TO PAINT
without "holidays" or thin spots

When you paint, do you look at your work when you've finished and say, "Gosh, there's a bad spot!" — or "How did I miss that?"

No matter how good your lighting, reflections and shadows can trick you into leaving "holidays" that *only a moving beam* of light will reveal. Here's how to avoid them:

1 With your left hand, point your flashlight at what your right hand is painting so that no shadowy corners can escape.

2 When a section is finished—and again after you finish the whole job—inspect the work with your flashlight, powered with "Eveready" batteries (they outlast all other brands)!

Proof! . . . in the laboratory . . . in your own flashlight . . .

OUTLAST "EVEREADY" BATTERIES ALL OTHER BRANDS!*

Brighter light, longer life! That's what you want in a flashlight battery. And that's what you get with "Eveready" brand batteries. Laboratory tests prove it. And the best "laboratory" of all—*your own flashlight*—proves it! That's why "Eveready" batteries *outsell* any other brand—because they *outlast* any other brand!*

**According to the "General-Purpose 4-Ohm Intermittent Test" of the American Standards Association, which most closely approximates average use.*

The registered trade-mark "Eveready" distinguishes products of

NATIONAL CARBON COMPANY, INC.

30 East 42nd Street, New York 17, N.Y.

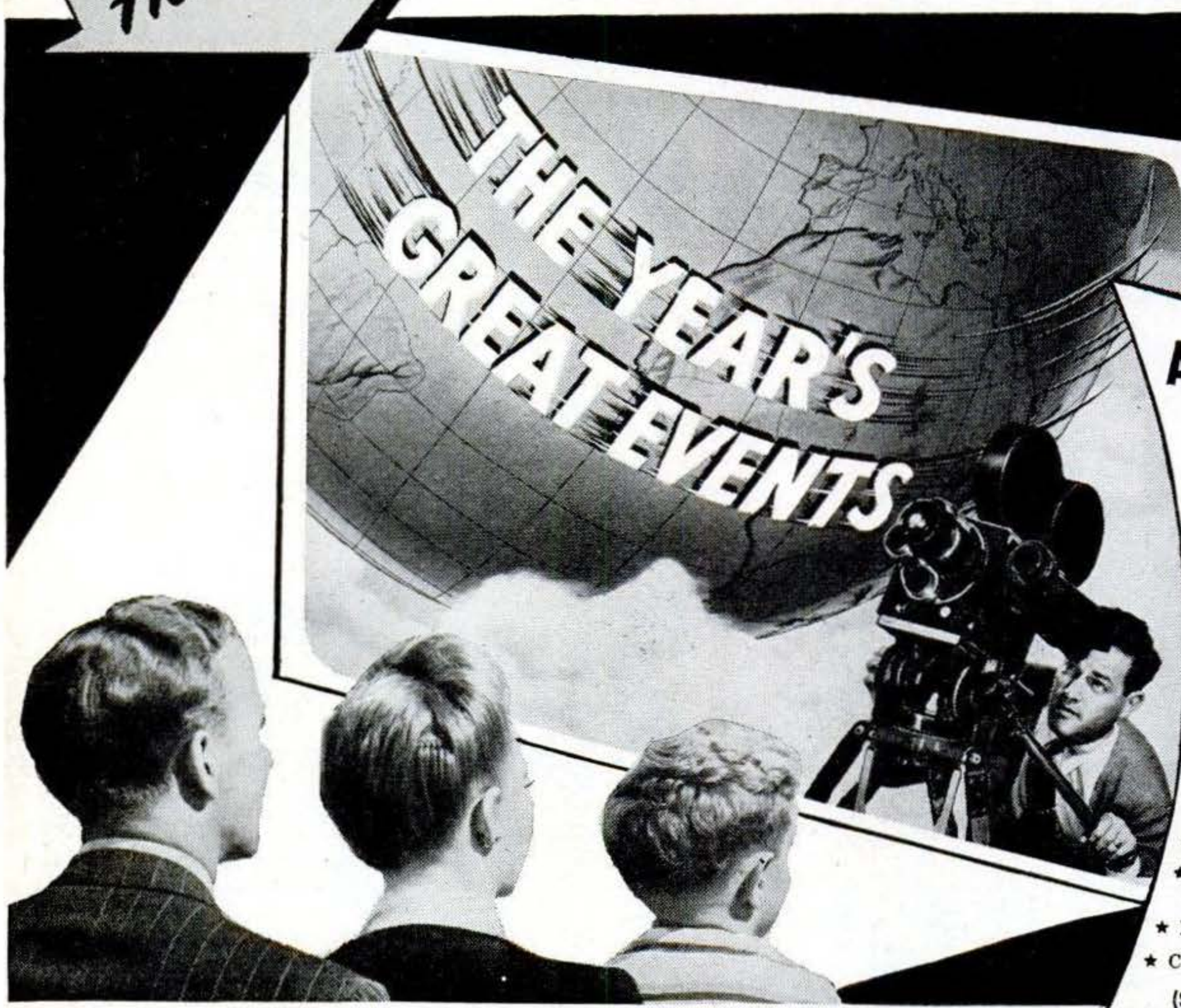
Unit of Union Carbide UCC *and Carbon Corporation*

Copyrighted material

In ONE Home Movie!

OWN CASTLE FILMS' "NEWS PARADE OF THE YEAR"

8MM
16MM



All this in ONE FILM

- ★ Texas City Disaster
- ★ 'Round the World in 72 hours
- ★ U. S. President's Travels
- ★ Uprising, Korea—Palestine
- ★ Britain's King in Africa
- ★ Nature on Rampage
- ★ Solar Eclipse in Brazil
- ★ Royal Romance
- ★ Crises in Greece

(Subject to change)

See your PHOTO DEALER or send handy Order Form *Today!*

The startling—the dramatic—the momentous! Headline events of 1947 filmed 'round the world as history was made! Here are the greatest news stories of an entire year packed into one exciting reel of authentic movies! This annual Castle Film, now world-famous, is a "collector's item" for projector owners. Order yours now.

FREE! To all Projector Owners! Send TODAY for new 1947 Castle Films De Luxe Catalog describing wide variety of thrilling home movies.

CASTLE FILMS

DIVISION OF UNITED WORLD FILMS INC.

445 PARK AVE. NEW YORK 22 | FIELD BLDG. CHICAGO 3 | RUSS BLDG. SAN FRANCISCO 4

ORDER FORM O-11

Send Castle Films' "NEWS PARADE OF THE YEAR" (1947) in the size and length indicated.

8 mm.	
☐ 50 feet	$1.75
☐ Complete	5.50

16 mm.	
☐ 100 feet	2.75
☐ Complete	8.75
☐ Sound, Complete	17.50

Name _____

Address _____

City _____ *Zone* _____ *State* _____

Remittance enclosed ☐ Ship C.O.D. ☐ Send me Castle Films' FREE De Luxe Catalog ☐

Copyrighted material

IF you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period in your life? Always provided that the rewards were good—a salary of $3,000 to $10,000?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing!*

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an accountancy position?

Just suppose you were permitted to work in a large accounting house under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then the more difficult ones. If you could do this—and if you could turn to him for advice as the problems became complex—soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

You cover accountancy from the basic Principles right up through Accountancy Systems and Income Tax Procedure. Then you add C. P. A. Training and prepare for the C. P. A. examinations.

As you go along, you absorb the principles of Auditing, Cost Accounting, Business Law, Statistical Control, Organization, Management and Finance.

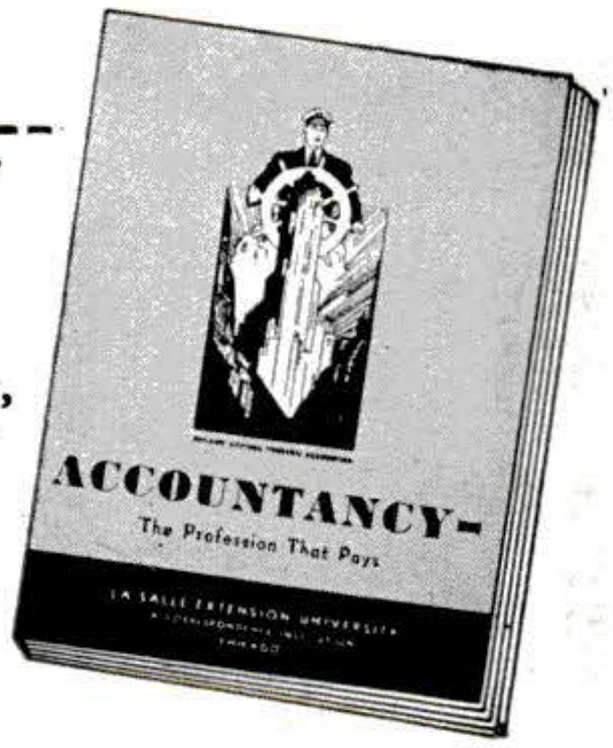
Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained.* It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Write For This Free Book

For your own good, don't put off investigation of *all* the facts. Write for our free 48-page book, "Accountancy, The Profession That Pays." It'll prove that accountancy offers brilliant futures to those who aren't afraid of serious home study. Send us the coupon *now.*

Over 2300 Certified Public Accountants among LaSalle alumni



LASALLE EXTENSION UNIVERSITY

A CORRESPONDENCE INSTITUTION

417 South Dearborn Street, Dept. 1183-H Chicago 5, Illinois

I want to be an accountant. Send me, without cost or obligation, the 48-page book, "Accountancy, The Profession That Pays," and full information about your accountancy training program.

Name.....

Address..... *City*.....

Position..... *Age*.....

Copyrighted material

DRAW ME!

TRY FOR A *Free Art Course*

Copy this girl and send us your drawing — perhaps you'll win a COMPLETE ART COURSE FREE.

FIVE PRIZES—five complete art courses FREE including Drawing Outfits (Value of each course, $240.00).

FREE! Each contestant submitting a drawing of sufficient merit will get a grading and our opinion as to whether his or her talent is worth developing.

Vocational Training for talented artistic persons is of tremendous importance. Almost everything must be designed before it can be manufactured.

Only talented persons can be trained as designers and illustrators. Splendid opportunities are available for trained Commercial Artists, Illustrators and Cartoonists. Many of our former students are earning excellent incomes in the profession. Here's an opportunity to test your talent FREE.

RULES

Contestants must be amateurs. Our students not eligible. 1. Make copy of girl 5 inches high, on paper 7 inches high. Draw only the girl, not the lettering. 2. Use only pencil or pen. 3. No drawings will be returned. 4. Print your name, address (town, county, state), age, phone number and present occupation on back of drawing. If you live in an apartment give apartment number. 5. All drawings must be received by November 30th, 1947. Prize winning drawings will be selected by our faculty.

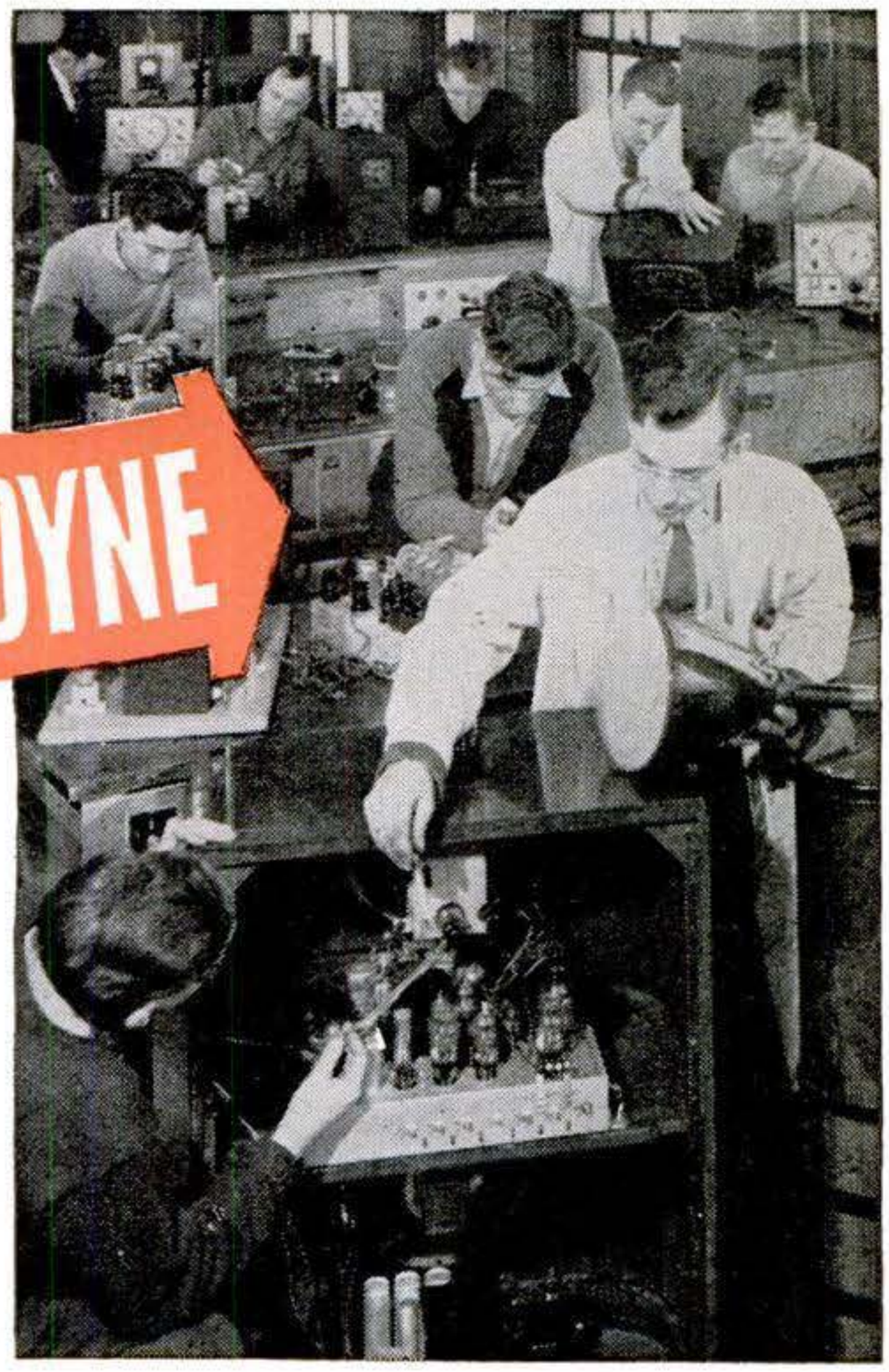
ART INSTRUCTION INC

Dept. 11147C, 500 S. 4th St., Minneapolis 15, Minn.

Copyrighted material

Learn RADIO

IN A FEW SHORT WEEKS



IN THE GREAT SHOPS OF COYNE

48 Years of Successful Training

Work on Actual Radio, Sound, Television Equipment! Expert Instructors Train You by Famous COYNE SHOP METHOD

Get ready quickly for YOUR FUTURE. Big opportunities are waiting for properly trained men in Radio Manufacturing, Radio Sales and Service, Television, Sound, Public Address. With COYNE "All Around" Training, many branches of Radio are open to you.

B. W. COOKE

NOT A "HOME-STUDY" COURSE

Learn Radio Fast!

As a **Coyne** student you work on real equipment in our great shops in Chicago — the Radio Center of the World. We do not teach by mail. All **Coyne** training is given right here in our big Shops in Chicago. You make rapid progress at **Coyne** because it's a shop course.

COYNE GRADUATES IN DEMAND

Whether you have had any actual Radio experience or not, we can train you in a few weeks for a better job, steady work and a real future in the Radio field.

First we train you for a good Radio job, then help you get it. **Coyne** graduates may use our **Lifetime Employment Service** as often as they wish.

Easy to Start Own Shop

If your ambition is to be your own boss, COYNE makes it easy! We include special training in how to start your own Radio Shop, how to get business, keep records, etc., right along with our course. Then we have Free Merchandising Service for graduates to solve many problems.

We'll Finance Your Training

Non-veterans who are short of cash can finance most of their tuition and pay it in easy monthly payments after graduation. You may earn while learning, to help defray living expenses. COYNE works with you to enable you to get the training you need.

VETERANS!

Coyne is authorized to train those who qualify under the G. I. Bill of Rights.

Physical Disabilities

Men with physical disabilities may qualify for training at no cost for tuition and subsistence. Coupon brings details.

SEND FOR BIG FREE BOOK!

Our new, fully illustrated **Coyne** Radio Book tells all about our great Chicago shops and our plans to help you. Packed with facts and pictures. No salesman will call. No obligation.

ADDED TRAINING

ELECTRIC REFRIGERATION

This valuable training now included with our Radio course.

B. W. COOKE, President, Radio Division

COYNE ELECTRICAL SCHOOL
500 S. Paulina Street
Dept. 87-4H
Chicago 12, Ill.
ESTABLISHED 1899

MAIL FOR BIG *Free* BOOK

B. W. COOKE, Pres., Radio Div.,
COYNE ELECTRICAL SCHOOL
500 S. Paulina St., Dept. 87-4H, Chicago 12, Ill.

Dear Mr. Cooke: Send me your Big Free Radio Book and all the facts . . . also full details of your "Student Finance" plan.

NAME.....

ADDRESS.....

CITY.....STATE.....

Copyrighted material

WERE the great personages of the past victims of a stupendous hoax? Could such eminent men of the ancient world as Socrates, Pericles, and Alexander the Great have been deluded and cast under the spell of witchcraft—or did the oracles whom they consulted actually possess *a mysterious faculty of foresight?* That *the human mind can truly exert an influence over things and conditions* was not a credulous belief of the ancients, but a known and demonstrable fact to them. That there exists a wealth of infinite knowledge just beyond the border of our daily thoughts, which can be aroused and commanded at will, was not a fantasy of these sages of antiquity, but a dependable aid to which they turned in time of need.

It is time you realized that the rites; rituals and practices of the ancients were not superstitions, but subterfuges to conceal the marvelous workings of natural law from those who would have misused them. Telepathy, projection of thought, the materializing of ideas into helpful realities, are no longer thought by intelligent persons to be impossible practices, but instead, *demonstrable sciences,* by which a greater life of happiness may be had.

One of America's foremost psychologists and university instructors, says of his experiments with thought transference and the powers of mind—"The successes were much too numerous to be merely lucky hits and one can see no way for guessing to have accounted for the results." *Have you* that open-minded attitude of today which warrants a clear, positive revelation of the facts of mind which intolerance and bigotry have suppressed for years? *Advance with the times;* learn the truth about your inherited powers.

Let this free book explain

The Rosicrucians (NOT a religious organization) have been leaders in introducing the ancient wisdom of mental phenomena. Established throughout the world for centuries, they have for ages expounded these truths to those thinking men and women who sought to make the utmost of their natural faculties. Use the coupon below—avail yourself of a pleasing book of interesting information which explains how you may acquire this most *unusual* and *helpful knowledge.*

The ROSICRUCIANS
(AMORC)

USE THIS COUPON

Scribe D.Y.T.
The Rosicrucians, AMORC,
San Jose, California.

I am sincerely interested in knowing more about this unseen, vital power which can be used in acquiring the fullness and happiness of life. Please send me, without cost, the book, "THE MASTERY OF LIFE," which tells me how to receive this information.

Name _____

Address _____ State _____

Copyrighted material

AUDELS REFRIGERATION & AIR CONDITIONING GUIDE.....$4

New from Cover to Cover—1280 Pages, Fully Illus. Covering basic principles, servicing, operation & repair of household, commercial & industrial refrigeration & air conditioning. A gold mine of essential important facts for engineers, servicemen, users.

AUDELS CARPENTERS & BUILDERS GUIDES—4 Vols. $6

A practical illustrated trade assistant on modern construction for carpenters, joiners, builders, mechanics and all woodworkers. 4 vols., 1600 pages, 3700 illustrations, flexible covers. Pocket size. Each volume sold separately $1.50 a vol.

AUDELS AUTOMOBILE GUIDE.....$4

A practical quick ready reference book for auto mechanics, service men, operators & owners. Explains theory, construction & servicing of modern motor cars, trucks, buses & auto type Diesel engines. 1700 pages, fully illustrated. 55 chapters. Indexed. A standard book for mechanics. New fluid drive covered.

AUDELS DIESEL ENGINE MANUAL..$2

A practical, concise treatise with questions and answers on the theory, operation and maintenance of modern diesel engines including General Motors 2 cycle Diesel. 384 pages, fully illus., flexible binding, pocket size. All details plainly brought out, this book is of extreme value to engineers, operators & students.

AUDELS WIRING DIAGRAMS.....$1

210 Pages. Illustrated. Gives practical facts on wiring of electrical apparatus. It shows clearly how to wire apparatus for practically all fields of electricity. Each diagram is complete & self-explanatory. Highly Endorsed Pocket Companion.

AUDELS PLUMBERS & STEAMFITTERS GUIDES—4 Vols. $6

A Practical Trade Assistant & Ready Reference. Explains in plain language & by clear illustrations, diagrams, charts, graphs, pictures principles of modern plumbing practice including Marine Pipe Fitting and Air Conditioning. 4 Vols.—1670 Pages—3642 Diagrams. Pocket size. Each Vol. Sold Separately $1.50 a Vol.

AUDELS SHEETMETAL WORKERS HANDY BOOK.....$1

Practical inside information. Fundamentals of Sheet Metal Work. 388 pages. Illustrated. 11 sections. Clearly written. Essential & important facts, figures, pointers in everyday language. Ref. Index.

AUDELS SHEETMETAL PATTERN LAYOUTS.....$4

Developed by Experts for Sheet Metal Workers, Layout Men & Mechanics. A Practical Encyclopedia in 10 Sections, size 7 x 10 x 2—1125 Pages—350 Layouts—1600 Illustrations. 1001 Key Facts. Fully indexed for ready reference in answering your layout problems. Covers all phases of sheet metal work including Pattern Cutting, Pattern Development & Shop Procedure.

AUDELS ANSWERS ON BLUE PRINT READING.....$2

For Mechanics & Builders. Covers all types of blue print reading including ship & airplane. 416 pages, fully illustrated.

AUDELS NEW MACHINIST & TOOLMAKERS HANDY BOOK.....$4

Covers modern machine shop practice in all its branches. 5 practical books in 1. New from cover to cover. Tells how to set up & operate lathes, screw and milling machines, shapers, drill presses and all other machine tools. 1600 pages, fully illustrated, 5 x 6½ x 2. Indexed. 5 sections. 1—Modern Machine Shop Practice. 2—Blue Print Reading & How to Draw. 3—Calculations & Mathematics for Machinists. 4—Shop Physics. 5—How to Use the Slide Rule. 60 chapters. Easy to read and understand. A shop companion that answers your questions.

AUDELS MATHEMATICS & CALCULATIONS FOR MECHANICS $2

Mathematics for home study or reference. 700 pages, 550 illus. Practical mathematics from beginning. How to figure correctly. Easy, correct methods covering complete review. Illus. & Indexed.

AUDELS HANDY BOOK OF PRACTICAL ELECTRICITY.....$4

For maintenance engineers, electricians & all electrical workers. 1440 Pages, 2600 Illus. Covers important electrical information in handy form—including Marine Wiring, Radio Principles, Welding. Indexed. A Key to a practical understanding of electricity.

AUDELS RADIOMANS GUIDE.....$4

A key to the practical understanding of radio including Frequency Modulation, Television, etc., Aircraft & Marine Radio. For radio engineers, servicemen, amateurs, 914 Pages, 633 Illustrations & Diagrams. Photos. Review Questions & Answers, Reference Index. Authentic, clear, concise.

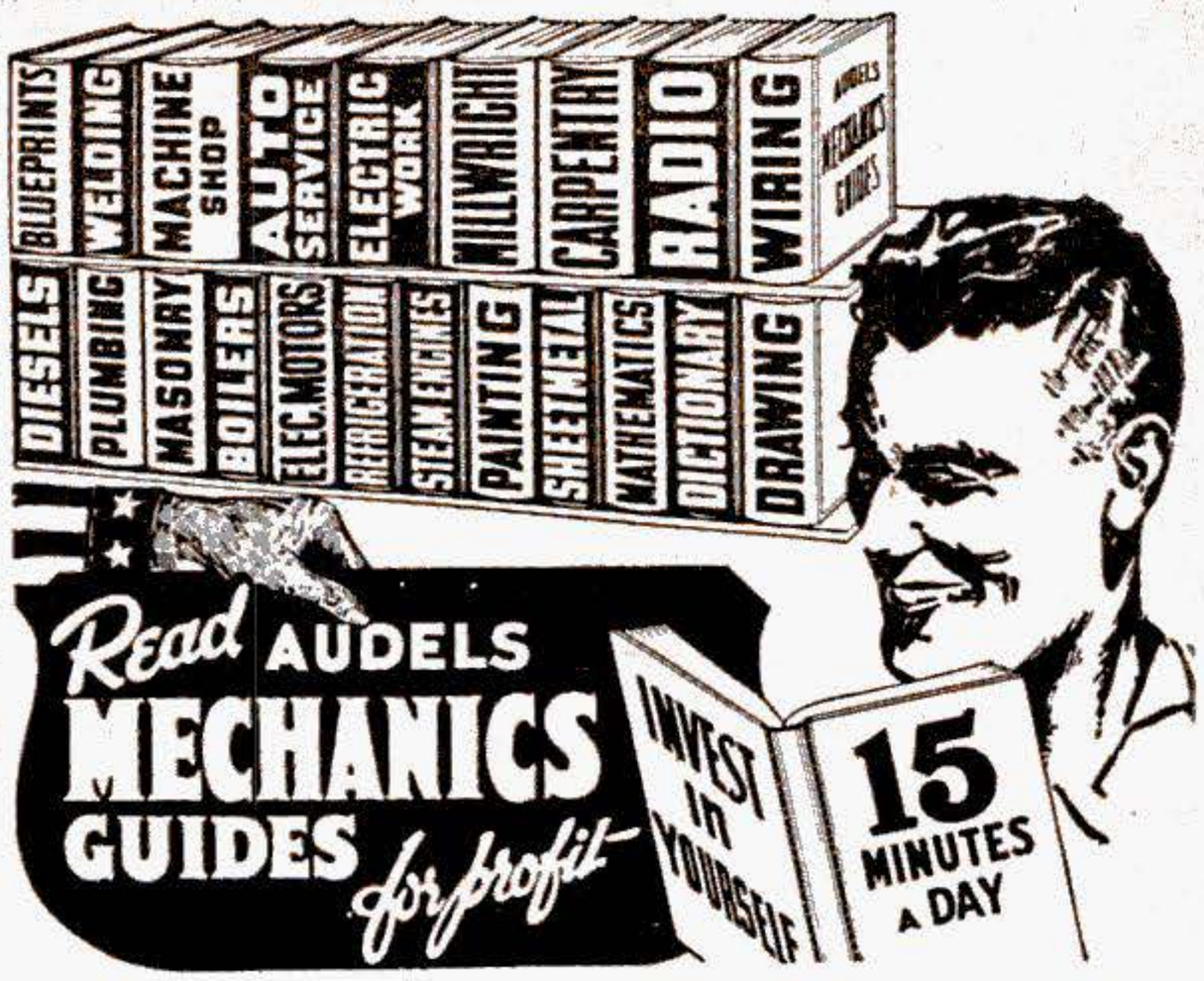
AUDELS ELECTRONIC DEVICES.....$2

Tells What You Want to Know About Electric Eye. Easily Understood. Covers photo-electric cells & their applications. Amplifiers, illumination, frequencies, voltage, photocell, tubes, Ohm's Law, wiring diagrams, etc.

AUDELS WELDERS GUIDE.....$1

A concise, practical text on operation & maintenance of all welding machines for all mechanics. Over 400 pages, illustrated. Covers all methods of electric and acetylene welding including airplane work.

AUDEL, Publishers, 49 W. 23 St., N. Y. 10



AN AUDEL GUIDE IS A GOOD FRIEND!

Step Up Your Own Skill with the Practical Facts and Figures of Your Trade. Save time and money with right methods, short cuts, labor saving ideas. CHECK NOW! You can look over any Audel Guide in your home. Start the Easy Payments if satisfied.

CUT HERE

MAIL ORDER

THEO. AUDEL & CO., 49 W. 23 St., New York 10, N. Y.

Please mail me for 7 days' free examination the books marked (X) below. I agree to mail $1 in 7 days on each book or set ordered, and to further mail $1 a month on each book or set ordered until I have paid purchase price. If I am not satisfied with Guides I will return them.

- ☐ Audels ELECTRIC MOTOR GUIDE . . . . . $4.
- ☐ Audels OIL BURNER GUIDE . . . . . 1.
- ☐ Audels REFRIGERATION & Air Conditioning Guide . 4.
- ☐ Audels POWER PLANT ENGINEERS GUIDE . . . 4.
- ☐ Audels PUMPS, HYDRAULICS & AIR COMPRESSORS 4.
- ☐ Audels WELDERS GUIDE . . . . . 1.
- ☐ Audels BLUE PRINT READING . . . . . 2.
- ☐ Audels SHEET METAL WORKERS Handy Book . . 1.
- ☐ Audels SHEET METAL PATTERN LAYOUTS . . . 4.
- ☐ Audels AIRCRAFT WORKER . . . . . 1.
- ☐ Audels MATHEMATICS and CALCULATIONS . . . 2.
- ☐ Audels MACHINISTS & TOOLMAKERS Handy Book 4.
- ☐ Audels MECHANICAL Dictionary . . . . . 4.
- ☐ Audels AUTOMOBILE GUIDE . . . . . 4.
- ☐ Audels DIESEL ENGINE MANUAL . . . . . 2.
- ☐ Audels MARINE ENGINEERS Handy Book . . . . 4.
- ☐ Audels MECHANICAL DRAWING GUIDE . . . . 1.
- ☐ Rogers MECHANICAL DRAWING and DESIGN . . 2.
- ☐ Audels MILLWRIGHTS and Mechanics Guide . . . 4.
- ☐ Audels CARPENTERS and Builders Guides (4 vols.) . 6.
- ☐ Audels PLUMBERS and Steamfitters Guides (4 vols.) 6.
- ☐ Audels MASONS and Builders Guides (4 vols.) . . . 6.
- ☐ Master PAINTER and DECORATOR . . . . . 2.
- ☐ Audels GARDENERS & GROWERS GUIDES (4 vols.) 6.
- ☐ Audels ENGINEERS & FIREMANS EXAMINATIONS 1.
- ☐ Audels ENGINEERS and Mechanics Guides Nos. 1, 2, 3, 4, 5, 6, 7 and 8 complete . . . . . 12.
- ☐ Audels Answers on Practical ENGINEERING . . . 1.
- ☐ Audels ELECTRICIANS EXAMINATIONS . . . . 1.
- ☐ Audels WIRING DIAGRAMS . . . . . 1.
- ☐ Audels Handy Book of PRACTICAL ELECTRICITY . 4.
- ☐ Audels ELECTRICAL POWER CALCULATIONS . . 2.
- ☐ Audels ELECTRONIC DEVICES . . . . . 2.
- ☐ Audels ELECTRIC Dictionary . . . . . 2.
- ☐ Audels RADIOMANS GUIDE . . . . . 4.
- ☐ Audels NEW ELECTRIC LIBRARY at $1.50 a Volume Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII

*Name*_____

*Address*_____

*Occupation*_____

*Employed by*_____ PSM

If you want to LEARN RADIO I offer you the finest, most practical training AT LOWEST COST!

I TRAIN YOUR MIND BY PUTTING YOUR HANDS TO WORK!

You Get 8 Big Kits of Radio Parts and Equipment, Including a Two-band 6 Tube Super Receiver! 16-Range Meter for Testing!

INVESTIGATE SPRAYBERRY TRAINING FOR YOUR OWN GOOD!

MAIL COUPON FOR 2 FREE BOOKS!

VETERANS—Get *Sprayberry training* without cost under G.I. Bill. Check coupon.

F. L. Sprayberry, Pres.,
SPRAYBERRY ACADEMY OF RADIO,
55117 Sprayberry Bldg., Pueblo, Colo.

Please rush my FREE copies of "How to MAKE MONEY in RADIO, ELECTRONICS and TELEVISION" and "How to READ RADIO DIAGRAMS and SYMBOLS."

Name _____ Age _____

Address _____

City _____ State _____

☐ Check here if Veteran

(Mail in envelope or paste on penny postcard)

Copyrighted material

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the U. S. Patent Office. For that reason, the Patent Office advises the inventor, unless he is familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

Patents

Trademarks

Copyrights

CLARENCE A. O'BRIEN & HARVEY B. JACOBSON
Registered Patent Attorneys
72-L District National Bldg., Washington 5, D. C.

Please send me copy of "Patent Guide for the Inventor" and also "Record of Invention" form. This request does not obligate me.

Name_____

Address_____

City_____ State_____

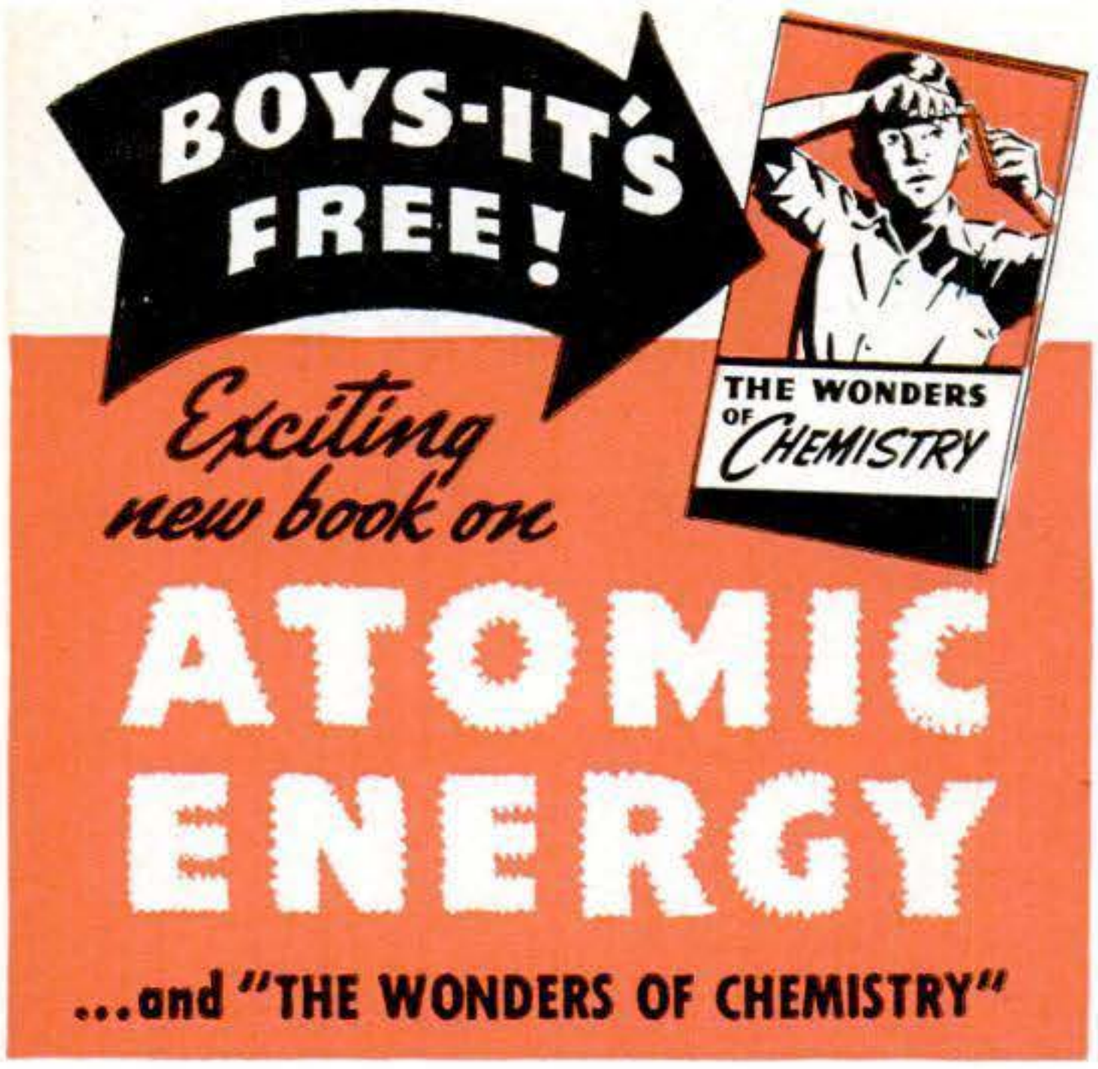
(Please write or print plainly.)

Registered Patent Attorneys

CLARENCE A. O'BRIEN & HARVEY B. JACOBSON

72-L District National Building + Washington 5, D. C.

Copyrighted material



Don't miss it, fellows! Introduces you to the miracles of Atomic Energy . . . and lets you in on secrets of the mysterious Atomic World. Also shows you how to amaze friends and family with Chemical Magic. Describes many fascinating home experiments. Tells about the fun, thrills, adventure and big future opportunities awaiting boys who know chemistry. Send for your FREE copy of "THE WONDERS OF CHEMISTRY." Send penny postal or letter to address shown below.

INSIST ON

CHEMCRAFT

America's Leading Chemistry Outfits!

NOW! with SAFE ATOMIC ENERGY EXPERIMENTS!

Now that safe, exciting Atomic Energy experiments have been added to its many other exclusive features, Chemcraft packs more fun than ever before in its 30-year history. So this Xmas, ask Mom and Dad for Chemcraft—America's leading chemistry outfit. Sold by leading stores everywhere. Chemcraft contains no poisons—no explosives, no unpleasant chemicals.

Atomic Energy in Chemcraft $25, $15, $10 outfits only. Other Chemcraft outfits with many exclusive features at $5, $3.95, $2.50 and $1.25.

Write for free copy of

"THE WONDERS OF CHEMISTRY"

THE PORTER CHEMICAL CO.

64 PROSPECT AVE. HAGERSTOWN, MD.

LETTERS

Wrong Rocket

Sir:

The rocket taking off on page 124 of the September issue, called a V-2, is actually a Wac Corporal, which takes off with the aid of a booster rocket. The booster is indicated by the black, smoky flame characteristic of powder boosters. . . .

JAMES STOCKARD

Nashville, Tenn.

PSM, which can usually tell the difference between a V-2 and a Wac Corporal, pleads an apologetic guilty. The rocket in the picture is indeed a Wac Corporal.

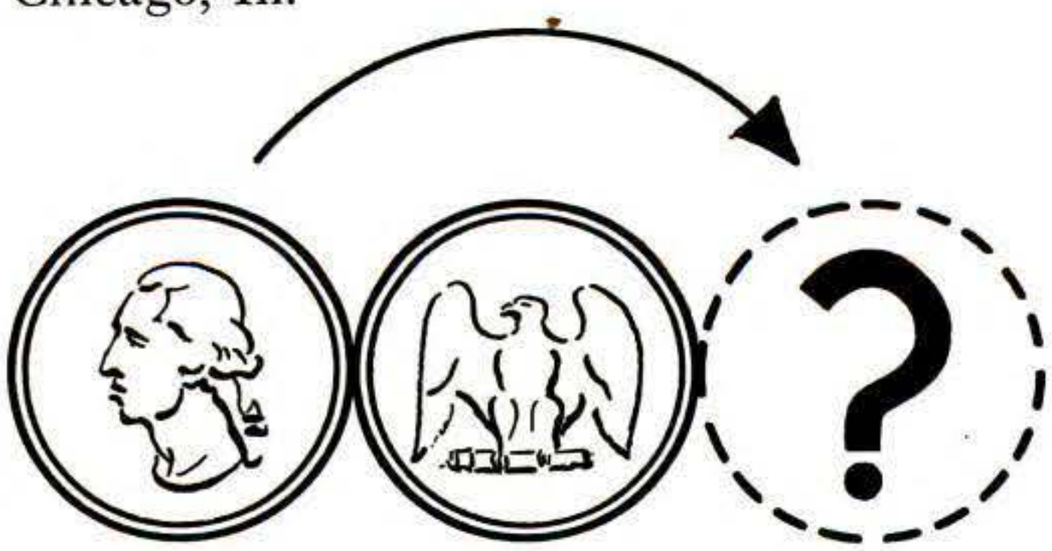
Heads Up!

Sir:

Two similar coins are made to touch as shown below. If the right-hand one is held stationary while the left is rotated around it to the position indicated by the question mark, will the head on the coin then be right side up or upside down?

ARTHUR M. LANDIS

Chicago, Ill.



Although the moving coin travels only half way around the stationary one, it makes a complete revolution, landing right side up. Why? Well, in addition to rolling half the circumference of the stationary coin, the moving coin at the same time makes half a revolution around the other. It thus makes half the revolution around its own axis and half around the stationary coin—and two halves make a whole.

Copyrighted material

INVENTORS

Patent Laws Encourage The Development Of Inventions

The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims.

The firm of McMorrow, Berman and Davidson is registered to practice before the U. S. Patent Office. Additionally, it maintains a staff of attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims for filing with the Patent Office.

If an inventor believes he has an invention, a search of the most pertinent prior U. S. patents should be made and a report obtained relative to its patentability. Where such report indicates that the invention appears patentable, in order to secure protection, diligence should be exercised in making application for a patent.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS — TRADE MARKS — COPYRIGHTS

142-A VICTOR BUILDING, WASHINGTON 1, D. C.

McMORROW, BERMAN & DAVIDSON
Registered Patent Attorneys
142-A Victor Building, Washington 1, D. C.

Send me further particulars as to patent protection and procedure and "Invention Record" form at once. I understand that this request does not obligate me.

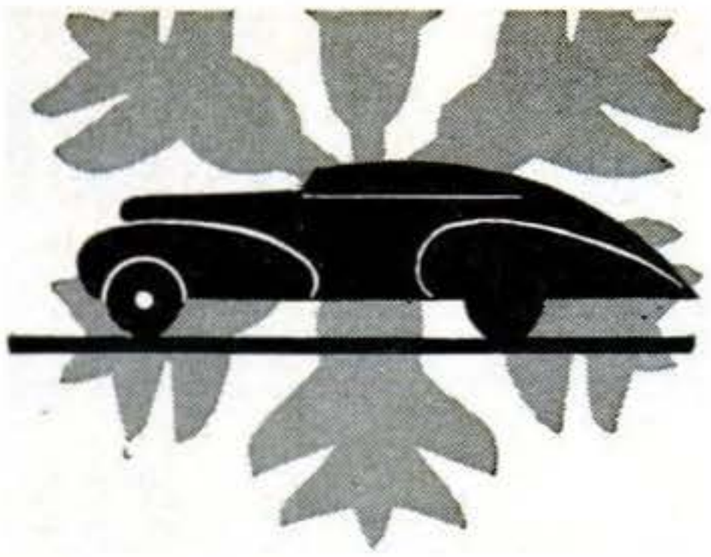
Name.....

Address.....

City.....State.....

(WRITE OR PRINT NAME CLEARLY)

Copyrighted material



More than ever . . .

LOW VISCOSITY WINTER OILS NEED PYROIL TO PROTECT YOUR CAR!

The winter oil in your crankcase is a low viscosity oil to help cold weather starting. But, after warming up, your car operates at temperatures practically as high as summer temperatures. For effective lubrication, oil rings and piston rings must operate freely, unhampered by gum and sludge. (*Pyroil prevents gum and sludge formation.*) When the ignition is turned off, low viscosity oil quickly drains off cylinder walls leaving them dry, subject to corrosion and scoring when making a dry start. (*Pyroil gives oil the property of clinging to cylinder walls, protecting them from corrosion and permitting easy safe starting.*)

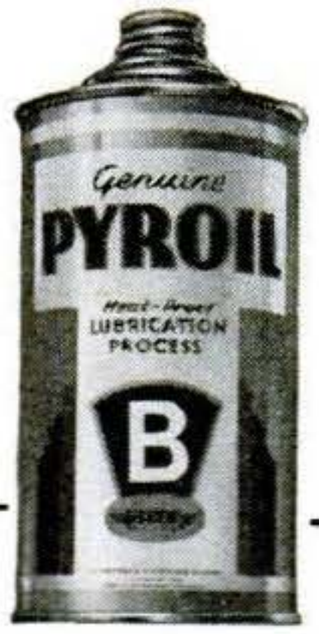
Add miles to your car . . . ask your gas station attendant to add *Pyroil*.

PYROIL for Aircraft Engines

Use Aircraft Pyroil B for lubricating oil, Aircraft Pyroil A for gasoline.

Manufactured and Guaranteed by Pyroil Company, 267 Main Street, La Crosse, Wisconsin.

Canadian Distributors: Central Purchasing Agency, Ltd., Toronto, Ontario



PYROIL COMPANY
267 Main Street,
La Crosse, Wisconsin

I want my car to last and run properly. Please tell me more about Pyroil and how it can accomplish this for me.

Name.....

Address.....

City or Town.....State.....

Jerry, the talking dog, is entertaining hospitalized veterans, by courtesy of the PYROIL Company. Picture of Jerry sent on request.

A Matter of Opinion

Sir:

In your June issue, you stated that the parachute landing pictured on page 89 was as perfect as any illustrated. If I had landed like the illustration shows when I went through jump school, I and anyone else would have been lucky to come out without any broken bones, and if I had been seen by a jump instructor, I would still be doing push-ups. . . .

The elbows should be turned in instead of out as in picture No. 2. This is so the jumper won't break his arms. Also, the jumper shown has landed on feet, buttocks and back. This would result in a back injury and possible pelvis fracture. The proper landing consists of five contact points: the balls of the feet, the calf of the leg, the thigh, the buttocks, and the push-up muscle. The feet take up 30% of the shock, and the rest is evenly distributed along the body. The feet should be together at all times . . . .

A Parachute Infantry Corporal
Fort Bragg, N. C.

PSM is at least partially exonerated by Col. David G. Erskine, of the Army Ground Forces, whose reply to the corporal follows. All concerned, however, seem to agree that the pictures could have been better.

Sir:

. . . Your reader is wrong in stating that 30% of the shock is absorbed on the balls of the feet; 40% is the correct figure. To state that the jumper is striking the wrong points of contact would be conjecture because illustration No. 2 is not sufficiently clear to determine this fact. Whether the jumper's feet are apart because of the force with which he hit the ground or simply as the result of a poor landing position is also conjecture since the photographs do not cover the entire landing sequence.

Picture No. 1 is a good example of proper landing attitude. Picture No. 2 is incorrect in these features: (a) The jumper should have his elbows down in front of his face. (b) His feet and legs should be together. Picture No. 3 is incorrect *if* the man is still in the process of completing his fall. (a) He should have his feet together. (b) His elbows should be in front of his face.

Col. David G. Erskine
Headquarters Army Ground Forces
Washington, D. C.

Copyrighted material

PREPARE NOW *for "a rainy day"*

FORTUNE-TELLING is *not* one of the attributes of I. C. S. We're much more concerned with helping those who need specialized training. For, regardless of what the future may bring, *trained men* will continue to hold the important positions in business and industry.

That's why we strongly recommend that you prepare yourself NOW for changes that may threaten your occupational status. In periods of uncertainty, *training is your best protection.*

I. C. S. can help you acquire much of the technical knowledge you need. Courses cover more than 400 commercial and industrial subjects. You study in your spare time . . . set your own pace . . . progress just as fast as your abilities and ambition permit.

Don't delay your program for self-advancement. Clip and mail this coupon TODAY. It will bring you full particulars about the courses in which you are interested.

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 7696-L, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating
- ☐ Plumbing
- ☐ Refrigeration
- ☐ Steam Fitting

Chemistry Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining
- ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician

Internal Combustion Engines Courses
- ☐ Auto Technician
- ☐ Aviation
- ☐ Diesel-Electric
- ☐ Diesel Engines
- ☐ Gas Engines

Mechanical Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging
- ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting
- ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake
- ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Railroad Section Foreman

Steam Engineering Courses
- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric
- ☐ Steam Engines

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Rayon Weaving
- ☐ Textile Designing
- ☐ Woolen Manufacturing

Business and Academic Courses
- ☐ Accounting
- ☐ Advertising
- ☐ Arithmetic
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship
- ☐ French
- ☐ Good English
- ☐ High School
- ☐ Higher Mathematics
- ☐ Motor Traffic
- ☐ Postal Service
- ☐ Salesmanship
- ☐ Secretarial
- ☐ Sign Lettering
- ☐ Spanish
- ☐ Stenography
- ☐ Traffic Management

Name_____ Home Address _____

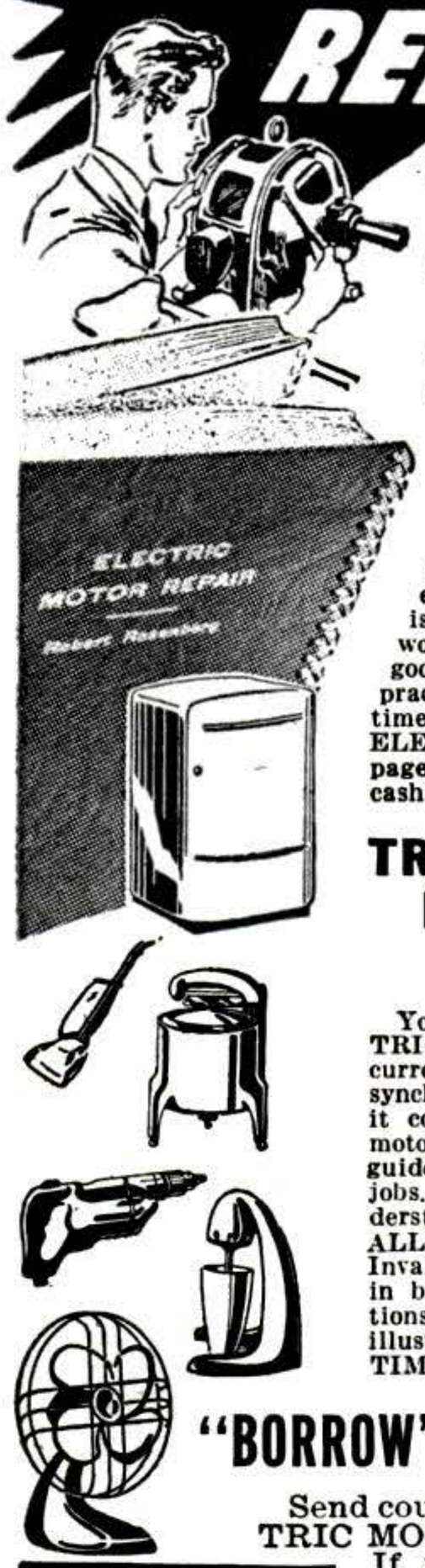
City_____ State_____

Age_____ Present Position_____ Working Hours_____ A.M. to_____ P.M.

Special tuition rates to members of the Armed Forces.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Copyrighted material

Now LEARN ELECTRIC MOTOR REPAIR!



Easily... Quickly... AT HOME $5 for ONLY....

Based on what you can learn *at home* from this big book—FOR ONLY $5 complete—you can train to profitably trouble-shoot, repair and rewind all types of electric motors. Every home, every office, every business and factory is a prospect for electric motor repair work. The field is tremendous, the pay good. Up to now, there has been no easy, practical way to learn the work in spare time study. The field is "wide open"—and ELECTRIC MOTOR REPAIR, the big 580-page book by Robert Rosenberg, helps you cash in on it within a few short weeks!

TRAIN FOR GOOD PAY IN A FIELD THAT ISN'T CROWDED!

You learn fast! You learn right! ELECTRIC MOTOR REPAIR covers alternating-current motors, direct-current motors and synchronous motors and generators. ALSO, it covers BOTH mechanical and electrical motor control systems. Quick-reference guides show exactly how to handle specific jobs. Every subject is not only written understandably, but further explained VISUALLY by more than 900 clear diagrams. Invaluable for beginners or for bench use in busy shops. Book divides into two sections, enabling BOTH text and related illustrations to be seen AT THE SAME TIME. Lies open flat while you work!

"BORROW" IT FOR 5 FULL DAYS!

Send coupon now. Practice from ELECTRIC MOTOR REPAIR for 5 full days. If not more than satisfied with book, return it. Every cent of your money will be cheerfully refunded and absolutely no questions asked. What could be fairer?

FREE! Check coupon for free literature on famous GHIRARDI RADIO-ELECTRONIC Training Books

NO RISK COUPON mail today

Dept. PS-117, Murray Hill Books, Inc.,
232 Madison Ave., New York 16, N. Y.

☐ Enclosed find $5 ($5.50 foreign) for my copy of the big ELECTRIC MOTOR REPAIR book; or ☐ send C.O.D. (no foreign C.O.D.'s) for this amount plus postage. In either event, if book is unsatisfactory for any reason, I may return it in 5 days and have my money refunded.

☐ CHECK HERE for free literature on Ghirardi RADIO-ELECTRONIC Training Books.

Name.....

Address.....

City & Zone..... State.....

MAKE UP TO $5.00 AN HOUR In Your Own YEAR 'ROUND Business!

ONLY A FEW DOLLARS PUTS YOU IN BUSINESS!

Many Clearing as High as $20 to $30 a Day *NET* Renewing Rugs, Carpets, Upholstery. New Method Now Used for Auto Upholstery. Write for Facts About Quick, Easy Way to Get Started

Here is the chance you've been looking for to step into a pleasant, dignified, big-pay business of your own that offers you a steady, year 'round income. Start on "a shoestring," full or spare time, right from your own home. Equal opportunities for men and women, young or old, in small towns or big cities. **No experience needed.** Many making big money with new Americlean System just cleaning auto upholstery. **Easy to learn.** We send you complete instructions and quick-cleaning supplies so you can start making money the very first day! Quick method cleans upholstery, rugs and carpets like new without taking off floor! Tremendous demand in homes, apartments, hotels, stores, office and public buildings. **Steady repeat** business. Territories going fast. Write today for full FREE facts. No cost or obligation. Rush letter or postcard now to

AMERICLEAN CO., Inc.
Dept. H-11, 211 North 7 St., St. Louis 1, Mo.

WRITE FOR FREE DETAILS NOW!

HEADPHONES

(Army P-23). 8000 ohms impedance. Leather covered, adjustable. With 5 ft. cord, PL-55 plug & rubber cushions. **$1.49**

HS-18 EARPHONES, 8000 ohm imped. With 14" cord & PL-54 plug. Less headband. Original carton..... **.89**

T-44A DYNAMIC MICROPHONE (AAF) With 5½ ft. cord, PL-179 plug & JK-26 ext. jack. Original carton ..... **.69**

EXPERIMENTAL TUBES. 20 asstd. receiving types for testing, research, etc. Filament tested....20 for **1.00**

POWER RHEOSTAT (IRC) 50 watt-15 ohms, ea. **.98**

Powerful ALNICO MAGNETS in many shapes & sizes always in stock. Write for latest illustrated supplements.

LEOTONE RADIO CO., 65 Dey St., New York 7, N. Y.

POWERFUL AIR PISTOL

Precision made "Sportsman Jr." is Safe, Accurate. Heavy; balanced like real automatic. Shoots B-B's, Darts, Pellets. Lots of fun for indoor target practice. With adaptors, ammunition, packed in attractive gift box. Send $3.95 Check or Money Order. Postpaid.

SIDNEY SMITH INTERNATIONAL
1112 Wilshire Blvd. Los Angeles 14, California

DETECTIVES

Home Study in Detective Training—Professionally Modernized—Recognized Instructors—Easy Payments—Write

INTERNATIONAL DETECTIVE TRAINING SCHOOL
1701-P Monroe St. N. E. Washington 18, D. C.

LEARN TO WRITE

The Magazine Institute, a private school owned, operated, and staffed by successful writers and editors, offers an up-to-the-minute course in writing for magazines, which makes it easy for beginners to get started in this rich field. You work in spare time at home. You may concentrate on either fiction or non-fiction. Send today for the FREE CATALOG describing the Magazine Institute method. VETERANS: THIS COURSE APPROVED FOR VETERANS' TRAINING.

The Magazine Institute, Inc.
Dept. 4611-E, 50 Rockefeller Plaza,
Rockefeller Center, New York 20, N. Y.
Please send free catalog, without obligation, to:

Name.....

Address.....

.....

☐ Check here if eligible under G. I. Bill
(Inquiries confidential. No salesman will call)

Copyrighted material

Now IN YOUR OWN HOME *Learn* RADIO ELECTRONICS

The Practical "HOME-TESTED" *Modern* "A-B-C" *Way*

YOU USE ALL OF THESE RADIO PARTS TO BUILD AND OPERATE **7** DIFFERENT RADIO RECEIVING CIRCUITS

INCLUDING:

1. Simple Receiver
2. Two Tube Receiver
3. Tuned Radio-Frequency Receiver
4. Short Wave Receiver
5. Aviation Band Receiver
6. 4-Tube Superheterodyne
7. 5-Tube Superheterodyne with Magic Tuning Eye

• • • PLUS SCORES OF OTHER FASCINATING, INSTRUCTIVE RADIO-ELECTRONIC EXPERIMENTS

WITH THE HELP OF

A EIGHT Big Kits of Actual "Learn-by-Doing" Radio Parts and Assemblies with which you make 133 fascinating SHOP METHOD EXPERIMENTS in your own home! Imagine building 7 different Radio Receivers that operate!

B A 16 mm Home Movie Projector and Twelve Reels of "Learn-by-Seeing" Home Movie Films . . . for picture-clear, fast understanding of Radio Fundamentals!

C Modern, well-illustrated, Loose-leaf Lessons, prepared in clear, simple, understandable language . . . to guide you throughout your training!

THEN GET THE HELP OF OUR EFFECTIVE EMPLOYMENT SERVICE

NO PREVIOUS RADIO OR ELECTRICAL EXPERIENCE NECESSARY

DeForest's Training, Inc. provides *every major home study aid* to help you learn Radio-Electronics rapidly and thoroughly . . . to give you the *experience* and *confidence* needed for a responsible, Good-Pay Job, or to Start a Business of Your Own! Here is a REAL opportunity field for YOU . . . *when you are a trained Radio-Electronics man!* Just think of the tremendously exciting future ahead of FM Radio, Aviation and Broadcast Radio, Sound Motion Picture Equipment, Servicing and Sales of Radio Equipment, etc. Put *yourself* in this picture . . . See how *you* can benefit from a PRACTICAL training in this fascinating work! Think, too, of the coming possibilities ahead of Radar, Facsimile and Television. Send TODAY for the interesting, opportunity-revealing book, "Victory for You!" See how others probably no more talented or ambitious than you, have advanced in earning power after this training . . . how YOU can do it too! Mail the coupon NOW!

VETERANS!

Big things are happening at DeForest's Training, Inc. for **veterans!** See how you can prepare yourself WITHOUT COST for a GOOD JOB or a BUSINESS OF YOUR OWN in the vast Radio-Electronic opportunity field.

16 MM MOVIE PROJECTOR

YOU USE "LEARN-BY-SEEING" MOVIES

DEFOREST'S TRAINING, INC. INCLUDES INSTRUCTION IN MOTION PICTURE SOUND EQUIPMENT, FM RADIO AND TELEVISION . . . RESIDENTIAL TRAINING IN OUR MODERN CHICAGO LABORATORIES ALSO AVAILABLE—ASK US FOR INFORMATION!

DeFOREST'S TRAINING, INC.
CHICAGO 14, ILLINOIS

E. B. DEVRY, President
DeFOREST'S TRAINING, INC.
2535-41 North Ashland Ave., Dept. PS-D11
Chicago 14, Illinois, U.S.A.

Send FREE "VICTORY FOR YOU!" BOOK, showing how I may make my start in Radio Electronics.

Name_____ Age____

Address_____ Apt.____

City_____ Zone____ State____

☐ If under 16, check here for special information.

☐ If a discharged Veteran of World War II, check here.

Copyrighted material

Pay Is Good

for Trained mechanics in both these Big Industries

LEARN IN A FEW WEEKS IN OUR BIG MODERN TRAINING SHOPS

AUTOMOTIVE MECHANICS

DIESEL MECHANICS

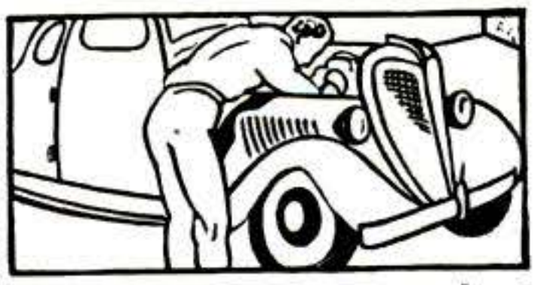
NOW IS THE TIME TO PREPARE FOR YOUR PLACE IN A GIANT INDUSTRY

Automobile and Diesel industries making up for lost time! There may never again be such opportunities for men who want better jobs or business of their own to get in on ground floor and go up fast! Yes—FOR MEN WHO ACT FAST, THINGS CAN HAPPEN FAST!

TRAIN ON ACTUAL EQUIPMENT

Chicago Motive Trades Institute makes rapid progress possible by Learn-By-Doing SUPERVISED SHOP TRAINING. In motive trades our institute gained nation wide fame training Auto Mechanics for U.S. Army. Same quality training available to you now. CONSULTATION AND PLACEMENT SERVICE WHETHER YOU ARE INTERESTED IN WORTHWHILE JOB OR SETTING UP YOUR OWN BUSINESS.

AUTOMOTIVE MECHANICS



Practical shop training on all types of equipment. Automotive mechanics needed to keep millions of cars, busses, trucks rolling. Efficient auto mechanics get fine pay. Can service, repair, install all mechanical and electrical parts of autos. Learn to overhaul and repair engines, transmissions, differentials, and other assemblies. Good pay, steady work, excellent opportunities for increased earnings for properly trained auto mechanics.

DIESEL MECHANICS

● Diesel engines are used in locomotives, ships, trucks, buses, power plants, tractors, farm equipment. Trained men needed to repair, rebuild, install, maintain, operate equipment. A big field that promises even bigger things in the years right ahead.

A NATIONALLY KNOWN INSTITUTION

Rapid progress possible by supervised learn-by-doing SHOP TRAINING. C.T.I. is an old established school, backed by years of experience—with trained instructors—with completely equipped shops.

VETERANS qualifying under "G.I. Bill" have all expenses paid by Government plus monthly subsistence allowance. Just mail coupon, we will handle all details. (LOW TUITION, EASY TERMS if you are not a veteran.)

CHICAGO MOTIVE TRADES INSTITUTE
Div. of Commercial Trades Inst.
1400 W. Greenleaf Ave., Dept. B-111
Chicago 26, Ill.

FREE
—IMPORTANT INFORMATION TELLING HOW TO GET STARTED

CUT COUPON ALONG THIS LINE

Fill Out, Cut Out, Mail Today

FACTS FREE for Men Who Want to Get Ahead
CHICAGO MOTIVE TRADES INSTITUTE, Dept. B-111
1400 W. Greenleaf, Chicago 26, Ill.

Send free illustrated Brochures and other information about the field I have checked below.

( ) Automotive Mechanics ( ) Diesel Mechanics
( ) Body and Fender
( ) Veteran ( ) Non Veteran

NAME.....

ADDRESS.....

CITY.....STATE.....

STUDY AT HOME

With An Educational Institution

Men with specialized training win higher positions, insure larger earnings, and are bigger successes in business and public life. Opportunities NOW greater than ever before. Send for our Catalog.

ARTS and SCIENCES

Courses in Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Plastics; Geology; Political Science; Theology; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture.

ENGINEERING

Courses in Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Chemical, Diesel, Automobile, Refrigeration, and Air Conditioning Engineering.

LAW

Complete Professional Law Course includes 18 Hornbrook Series college grade textbooks. Courses also in Commercial Law, Patent Law and Medical Jurisprudence.

McKinley-Roosevelt Incorporated, 4610-AB, Sheridan Rd., Chicago 40, Ill.

SHORTHAND in 6 Weeks at Home

Famous Speedwriting system. No signs or symbols; uses ABC's. Easy to learn; easy to write and transcribe. Fast preparation for a job. Surprisingly low cost. 100,000 taught by mail. Used in leading offices and Civil Service. Write for free booklet. Speedwriting, Dept. 2611-7, 55 W. 42 St., N. Y. 18, N. Y.

Hollywood Experts Help You

Make Good in RADIO-TELEVISION at Home

Direct from Hollywood, nerve-center of broadcasting, Television, Radio and Sound activities, comes **R-T-A's time-proven** and **tested home training.** Here at last—easy to learn, home instruction that quickly qualifies you for steady, good-pay jobs or your own Radio business. Get full details at once! Send for **FREE BOOK** "How to Make Good In Radio-Television." **R-T-A APPROVED FOR VETERANS.**

RADIO TRAINING ASS'N OF AMERICA, Dept. PS-11
5620 Hollywood Blvd. Hollywood 28, Calif.

LEARN MONEY-MAKING CARTOONING

IN SPARE TIME — by Easy Picture Chart Method

Same Simplified Method that has helped train creators of "Terry & Pirates," "Freckles," "Out Our Way," "Winnie Winkle," "Reg'lar Fellers," "Strange As It Seems," "The Neighbors," and many others. Earn while learning. Send 10c for Picture Chart (to test your ability). Samples of successful students, and full details. (State age.)

The Landon School, 4731 Cleveland Transit Bldg. Cleveland, O.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. G.I. Approved. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 83-S, 646 N. Michigan Ave., Chicago 11, Ill.

MAKE IT YOURSELF

THE HOME MECHANIC'S HANDBOOK

THE MOST USEFUL BOOK YOU'LL EVER OWN

This great 804-page book shows you how to do any kind of job about the home and in the home workshop with professional results. Carpentry, metal work, electrical work, plumbing, masonry, painting and decorating are all explained by master craftsmen and actual "hands-at-work" photographs anyone can understand. Here's everything you need to know to make old things new, new things better! **Only**..... **$2.95 down**

D. Van Nostrand Company, Inc.
250 Fourth Avenue, New York 3, N. Y.

EXAMINE THIS GREAT BOOK **FREE**

Please send me a copy of THE HOME MECHANIC'S HANDBOOK. Within 10 days I will either return the book, or send you $2.95, plus postage, as a down payment, and $2 a month until the total price of $6.95, plus postage, is paid.

NAME.....
Please print

ADDRESS.....

CITY & ZONE.....STATE.....

Pop. Sc. Nov. 47

Copyrighted material

PATENT PROTECTION *for* INVENTORS

A PATENT IS A VALUABLE RIGHT

On the basis of a provision in the Constitution of the United States, Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection by obtaining a patent from the United States Patent Office.

VICTOR J. EVANS & CO. has a staff of experienced registered patent attorneys, available to assist inventors in the preparation and prosecution of their cases before the Patent Office. Detailed information and the steps to be taken in obtaining patent protection will be furnished upon request.

FORM BELOW FOR MAILING CONVENIENCE

VICTOR J. EVANS & Co.

Merlin M. Evans

REGISTERED PATENT ATTORNEY

240-M Merlin Building, Washington 6, D. C.

Please forward to me detailed information regarding procedure to obtain Patent Protection, together with your convenient "Evidence of Invention" form.

Name.....

Address.....

City and State.....

PATENTS • TRADEMARKS • COPYRIGHTS

Copyrighted material

SUCCESS BRINGS

THE GOOD THINGS OF LIFE

FIND OUT ABOUT OPPORTUNITIES IN INDUSTRIAL ELECTRONICS

It's a perfectly natural human desire to want more money, a better job, prestige and all the other good things of life. Who gets them? Look about you. Success you will see, comes to the man who is trained for his job.

A new world of opportunity is today beckoning to ambitious men. One of the most important and exciting fields is **INDUSTRIAL ELECTRONICS.** It is attracting experienced electrical men as well as younger fellows seeking a way to bigger earnings and a more secure future.

OPPORTUNITY LIES AHEAD

Industrial Electronics is not Radio. It has nothing to do with radio transmitters and receivers. It is totally new application of electric power, applied to modern production by means of the magic of the vacuum tube. Everywhere industrial electronic devices are replacing the old-time electrical controls, and processes. Industrial Electronics is Modern Industrial Electricity.

"Every electrician should know—must know—Industrial Electronics." That's what many Union leaders are telling their members, today. They know that the use of Industrial Electronics devices is growing by leaps and bounds. They know that to install and service this equipment, even the best of present-day electricians must first have had special training.

GET READY NOW!

Now is the time to get into Industrial Electronics, while the field is in its infancy . . . and while it is rapidly developing a need for thousands of trained experts. Tomorrow's leaders are training today.

And here is a School equipped in every way to train you for Industrial Electronics work—one of the largest and most completely equipped, and one of the few of its kind in America—a School that already has trained thousands of men for industrial opportunities.

LEARN AT HOME OR COME TO OUR SCHOOL

Learn Industrial Electronics—now, while the time is ripe. You don't need any advanced schooling or previous experience. If you are at all mechanically inclined and have gone to high school for at least one year or have an equivalent education, we can teach you Industrial Electronics.

You can take most of your training at home, in your spare time—or you can come to Chicago and take your entire training in our completely equipped shops and laboratories. Either way you quickly acquire the fine points, practical skill, and broad, technical "know how" that makes the expert Industrial Electronics Technician.

A GUIDE FOR YOUR FUTURE—Complete facts about Industrial Electronics. Packed with pictures. Tells all about our successful training plan. Coupon will also bring details about moneymaking opportunities for trained men and our Life-Time Free Employment Service. No obligation. Mail coupon TODAY. Investigation may start you up the ladder of Success.

AUTHORIZED TO ACCEPT VETERANS FOR G.I. TRAINING

INDUSTRIAL TRAINING INSTITUTE,
2150 Lawrence Ave., Dept. P2LL Chicago 25, Ill.

Please send me, FREE, your "Camera Visit" booklet and information about the opportunity for trained men in INDUSTRIAL ELECTRONICS. It is understood that I will be under no obligation.

NAME.....

ADDRESS.....

CITY.....STATE.....

ARE YOU A VETERAN?.....

SEND FOR THIS BOOK —IT'S FREE

GET THE FACTS ABOUT AMERICA'S FOREMOST SCHOOL OF PRACTICAL TRAINING.

Make MORE MONEY

Learn Screen Process Printing I SHOW YOU HOW This Easy Way at Home!

No machinery. Print thru stencil mounted on silk stretched frame.

1 HOW TO START YOUR OWN BUSINESS —My training shows you how you may start your own business and cash in on the tremendous field open to you in Screen Process—with an investment of a few dollars.

Make own stencils. Trace lines on stencil film. No art experience necessary.

2 HOW TO GET A GOOD PAY POSITION —Many of my students earn extra money in spare time at home, while learning. My special "Earn While You Learn" lessons, with the Kit of Supplies I give you—show you how.

3 HOW TO EARN EXTRA MONEY IN SPARE TIME—If you are in the rut of a low pay, uninteresting job, Screen Process work offers you the opportunity to earn good wages and the better things of life for you and your family.

You can print signs, displays, toys, etc., with this simple equipment.

Send for FREE BOOK

My big free illustrated book, "Opportunities in Screen Process," explains the big demand for Screen Process printed Signs and Displays, Toys and Games, Textiles, Decal Transfers, Plastics and Glass, Pictures and Greeting Cards, Advertising Agencies and other businesses. No art or previous experience required. You Learn While Doing with the 2 BIG KITS of SUPPLIES I give you. Write TODAY. STATE IF VETERAN.

CALIFORNIA SCHOOL OF SCREEN PROCESS
3740 OVERLAND BLVD., DEPT. PS-117, LOS ANGELES 34, CALIF.

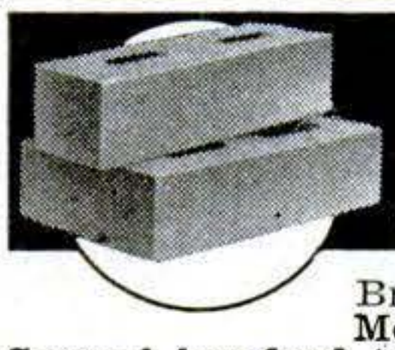
MAKE HOLLYWOOD STYLE CEMENT POTTERY, birdbaths, benches, coffee tables, stucco-rock, rustic garden walks, etc. Many more. Color concrete with chemicals. Start with small capital. 10¢ brings sample, pictures, details.

HOLLYWOOD CEMENTCRAFT
8527-B Wonderland Ave. Hollywood 46, Calif.

LET ANGORA RABBITS GROW YOUR INCOME

Earn up to $3000.00 a year or more. Wool brings top prices. Plenty markets. Steady cash income. Future prospects bright. Write today for free information, prices and markets.

WHITE'S RABBITRY, Dept. PS, Newark, Ohio



More Local Manufacturers are Needed-NOW

Brikcrete is sweeping the country. More local plants are badly needed. Several hundred territories are being opened up for local Brikcrete manufacture by men of vision and aggressiveness. Brikcrete ties in with today's huge building program. Makes possible better construction at lower cost. Truly better than brick; actually cheaper than lumber. Combines strength, safety, insulation value, colorful beauty.

World's Most Modern Masonry

Brikcrete is made in locally owned plants, using local materials and local labor. That's why high quality and low price still permit a 100% to 150% mark-up. We supply complete equipment; easy terms if required. Generous cooperation. Exclusive manufacturing privileges in protected territory. Write or wire for information.

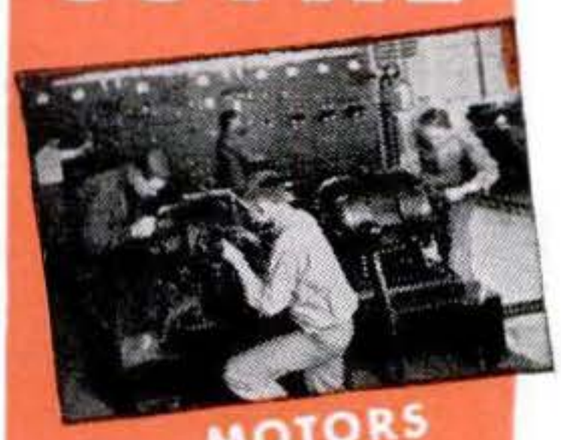
BRIKCRETE ASSOCIATES, INC.
4677 S. Division, Grand Rapids, Mich.

BRIKCRETE

Copyrighted material

Learn ELECTRICITY in the GREAT SHOPS OF COYNE

ACTUAL SHOP SCENES AT COYNE



MOTORS

ARMATURES

REFRIGERATION

LIGHTING

NOT A "HOME-STUDY COURSE"

B. W. COOKE

For nearly 50 years, the Great Shops of COYNE in Chicago have been training men to step into the better-paying jobs in ELECTRICITY. Here in just a few short weeks YOU can quickly prepare for amazing opportunities.

As a Coyne student you work on real equipment — just like you'll use later on the job. We do not teach by mail. You get actual shop work plus necessary theory. Coyne training is practical. You make rapid progress at COYNE because it's a shop course.

GET ALL-AROUND TRAINING . . . . in a Few Short Weeks

Why be satisfied with a "one-operation" job? At Coyne you learn Motors, Armature Winding, House and Factory Wiring, Appliances, Power Plant Work, Illumination, Electrical Maintenance—plus the fast-growing branch of Industrial Electronics. Whether you're experienced or not, we train you for a good job, then help you get it! Coyne graduates may use our Lifetime Employment Service as often as they wish.

INDUSTRIAL ELECTRONICS and REFRIGERATION Included

Added training in Electric Refrigeration—principles, testing, repairing—is included with this course. Industrial Electronics given as part of our "all-around" Electrical Training.

VETERANS! Coyne is authorized to accept veterans for G. I. Training. Coupon brings special G. I. Bulletin.

NON-VETERANS who are short of cash can finance most of their tuition and pay it in easy monthly payments after graduation.

ANY MAN WITH A PHYSICAL DISABILITY whether a Veteran or not may qualify for **Coyne** training at no cost to himself for tuition or subsistence. Mail coupon for details.

MAIL COUPON for Big FREE Book

Find out NOW what **Coyne** offers in training for your future. Coupon brings big book filled with fascinating pictures of our great shops and our plans to help YOU. Get your copy FREE. No cost or obligation, and no salesman will call. Rush the coupon TODAY.

B. W. Cooke, President,
COYNE ELECTRICAL SCHOOL, Dept. 87-73,
500 S. Paulina St., Chicago 12, Ill.

Send me your Free Book and tell me about your plans to help me—including Student Fianance and added Training in Industrial Electronics and Electric Refrigeration.

NAME.....

ADDRESS.....

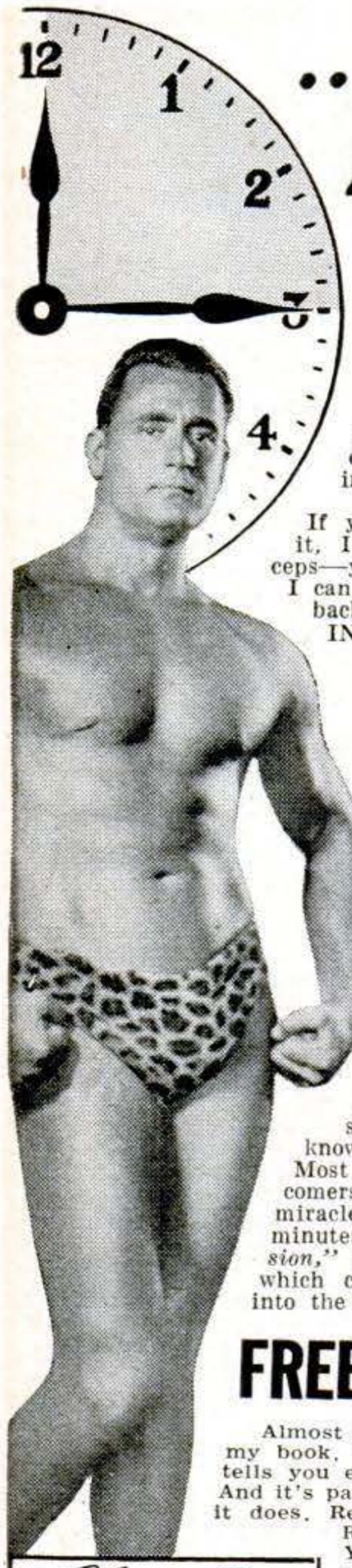
CITY.....STATE.....

COYNE
ELECTRICAL SCHOOL
500 S. Paulina St., Dept. 87-73, Chicago 12, Illinois

ESTABLISHED 1899

Copyrighted material

Lend Me 15 Minutes A Day



..and I'll prove I can make you a NEW MAN

I'M trading in old bodies for new! I'm taking men who know that the condition of their arms, shoulders, chests and legs—their strength, "wind," and endurance—is not 100%. And I'm making NEW MEN of them!

If you can simply raise your arm and flex it, I can add SOLID MUSCLE to your biceps—yes, on each arm—in double-quick time! I can broaden your shoulders, strengthen your back, develop your whole muscular system INSIDE and OUTSIDE!

What Only 15 Minutes a Day Can Do

I can add inches to your chest, give you a vise-like grip, make those legs of yours lithe and powerful. I can shoot new strength into your old backbone, exercise those inner organs, help you cram your body so full of pep, vigor and red-blooded vitality that you won't feel there's even "standing room" left for weakness and that lazy feeling! Before I get through with you I'll have your whole frame measured" to a nice, new, beautiful suit of muscle!

I Was a 97-lb Weakling

All the world knows I was ONCE skinny, scrawny 97-pound weakling. And NOW it knows that I won the title, "The World's Most Perfectly Developed Man." Against all comers! How did I do it? How do I work miracles in the bodies of other men in only 15 minutes a day? The answer is *"Dynamic Tension,"* the amazing method I discovered and which changed me from a 97-pound weakling into the champion you see here!

FREE THIS FAMOUS BOOK "EVERLASTING HEALTH AND STRENGTH"

Almost two million men have sent for and read my book, "Everlasting Health and Strength." It tells you exactly what *"Dynamic Tension"* can do. And it's packed with pictures that SHOW you what it does. Results it has produced for other men. RESULTS I want to prove it can get for YOU! Learn how you can actually become a NEW MAN, right in the privacy of your own home and in only 15 minutes a day! Mail this coupon NOW! CHARLES ATLAS, Dept. 111, 115 East 23rd St., New York 10, N. Y.

Charles Atlas

Actual photo of the man who holds the title, "The World's Most Perfectly Developed Man."

CHARLES ATLAS, Dept. 111,
115 East 23rd St., New York 10, N. Y.

I want the proof that your system of *"Dynamic Tension"* will help make a New Man of me—give me a healthy, husky body and big muscular development. Send me your free book, "Everlasting Health and Strength."

Name..... Age.....
(Please Print or Write Plainly)

Address.....

City..... State.....

EARN
BIG MONEY! METAL TRADES

Courses offered in:

- Machinist-Toolmaking
- Mechanical Drafting
- Tool and Die Designing & Engineering

Practical training in fully equipped shops and drafting rooms by accredited engineers and instructors. Established two decades.

Approved for Veterans • Day and Evening Classes
Free Employment Service • Dormitory Accommodations
Call or write for Free Bulletin

ALLIED SCHOOL OF MECHANICAL TRADES
44 Allied Bldg., 1338 S. Michigan Ave., Harrison 3915, Chicago 5, Ill.

DENTAL TECHNICIANS

Nationwide openings for trained men. Learn by simple home study—with theory and actual practice as a guide.
EASY STEP-BY-STEP TECHNIQUE

for information write to DEPT. PS-1

DENTAL ARTS INSTITUTE
1122 MARKET STREET, SAN FRANCISCO 2, CALIF.

---

free

Make money. Know how to break and train horses. *Write today for this book FREE*, together with special offer of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse, check here ( ) *Do it today—now.*

BEERY SCHOOL OF HORSEMANSHIP
Dept. 5811 Pleasant Hill, Ohio

LEARN TO WRITE *a Good Hand!*

FOR BUSINESS AND SOCIAL SUCCESS!

Now Good Handwriting is Essential in Business and Social Life. So easy to improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: ☐ **New Free Book,** "How to Become a Good Penman", or check books wanted, $1.00 each. ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Engrossing Alphabets ☐ Bird and Design Flourishing ☐ Complete Set $4.50 ☐ Enclose 10c for your name beautifully written and special penpoint for shaded writing. Satisfaction or Money Back.

S. A. Ziller, President, TAMBLYN SCHOOL OF PENMANSHIP
439 Ridge Bldg. *In Business Over 52 Years* **Kansas City, Mo.**

THERE'S MONEY IN CARTOONS!

RAYE BURNS will teach you HOW to CREATE ORIGINAL CARTOONS at home that you may SELL! Course contains 26 lessons and over 600 illustrations. All for *Only* . . **$2.85**
Send name and address for free details.

RAYE BURNS SCHOOL, Dept. S, Box 3583, CLEVELAND, OHIO

Photography *for* PLEASURE or PROFIT

Learn at home. Spare time. Practical basic training. Long-established school. Many have earned while learning. Send coupon below for free booklet, "Opportunities in Modern Photography" and full particulars.

AMERICAN SCHOOL OF PHOTOGRAPHY
1315 Michigan Avenue Dept. 1368 Chicago 5, Illinois

Send booklet, "Opportunities in Modern Photography," full particulars and requirements. No salesman will call.

Name..... *Age*.....
Address.....
City..... *Zone*..... *State*.....

Copyrighted material

Attend CHICAGO TECH

Approved for G.I. Training

•

TIME-SAVING COURSES

•

DAY and EVENING CLASSES

•

1 YEAR
2 YEAR
3 YEAR
courses

•

BUILDING
DRAFTING
ENGINEERING
AIR CONDITIONING
REFRIGERATION
ELECTRICITY
RADIO

Learn ENGINEERING DRAFTING . . . BUILDING in Chicago, Industrial Hub

Get your training at Chicago Tech in the Nation's industrial center. Chicago provides unequalled opportunities for part-time employment while training and for permanent positions upon graduation. Many other cultural and recreational advantages described in Catalog, —sent Free!

Practical Time-Saving Courses

Chicago Tech, founded 43 years ago, has trained thousands of men now occupying important places in industry the world over. Training combines theory and practice in 1 year, 2 year, and 3 year (Degree) courses. Saving in time means earlier graduation,—and consequently earlier employment.

MAIL COUPON TODAY *FOR ILLUSTRATED CATALOG*

CHICAGO TECHNICAL COLLEGE
TECH BUILDING
2000 South Michigan Avenue
Chicago 16, Illinois

Terms start January, April, July and October. Get information now to arrange for early admission and accommodations.

CHICAGO TECHNICAL COLLEGE
P-86, Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Ill.

Please send me without obligation free booklet on Time-Saving Technical Training.

Name.....*Age*.....

Address.....

City.....*Zone*.....*State*.....

Copyrighted material

For top returns on your skill — try PLASTIC CRAFT

You will be delighted with the charming, professional-looking results—and the money—that you can get with plastics. You need no special skill, no expensive materials. With minimum effort and with the tools you already have, you can

make extra money (and have fun doing it)

solve your Christmas gift problems

make many useful and beautiful things for your own home.

COMPLETE instruction for only $5.

This book tells you exactly how to make scores of strikingly beautiful and useful articles for which there is a ready market. All the instruction you need is here—all information on materials, where to get them, what to buy for different purposes; what tools you need for each job and just how to use them. You will be amazed at the "finished" professional look of things you can make with the simplest tools, the stunning effects you can get with simple design. Get your copy NOW and start cashing in on the big Christmas demand.

Mail this coupon for on-approval copy

THE MACMILLAN CO., 60 FIFTH AVE., NEW YORK 11

Please send me a copy of PLASTIC CRAFT @ $5. with the privilege of returning it within 10 days without charge.

Signed.....

Address.....

LEARN A TRADE NOW *in Sunny* CALIFORNIA

- **REFRIGERATION, RADIO, ELECTRICAL APPLIANCE** Service and Repair . . . a Combination Course in three opportunity fields.
- **PLASTERING**—a busy field these days!
- **UPHOLSTERING**—available, Los Angeles or Chicago.

Here are three *career fields* offering many opportunities to trained men, either in good paying positions or through a business of your own. GENERAL TRADE SCHOOLS' courses are PRACTICAL, INTENSIVE. Instructors are master craftsmen who know the practical side of each job.

School hours are concentrated so that time is available for taking part-time employment if desired.

Immediate Enrollment. *Courses Approved for Veterans Available for Non-Veterans*

MAIL THE COUPON NOW FOR COMPLETE INFORMATION

General Trades Schools
1601 S. Western, Dept. PS-11, Los Angeles 6, Calif.
Please send me FREE information on your courses as checked below:

Refrig., Radio, Elect. Appl.____ **Plastering**____ **Upholstering**____

Name____ **Age**____

Street____

City____ **Zone**____ **State**____

Veteran____ **Non-Veteran**____

Have an OFFICE OF YOUR OWN!

LEARN NEW PROFITABLE PROFESSION
At Home in 60 Days, Men & Women, 18 to 70!

Be Your Own Boss and the Boss of Others. Be Respected. Meet Interesting People.

Earnings of men and women in this profession run as high as $5,000-$15,000 yearly. Others make good money in spare time. Little money needed to start. A business where your earnings begin sooner. Easy to learn. No selling or goods to buy. No experience necessary. A depression-proof business. A course of action to guide you step by step as you earn. All 53 lessons sent at once to use as operating manuals. Easy terms. Diploma. Money-back agreement. Write for **FREE BULLETIN.**

BY MAIL in *Easy Lessons*

FRANKLIN CREDIT SCHOOL
Dept. 71-M ROANOKE 7, VIRGINIA

MAKE MONEY CASTING AT HOME
•• *FREE FACTS SENT* ••

Cast thousands of perfect Plaques, Book Ends, Ash Trays, Etc. Plaster, Liquid Marble, Etc. ENORMOUS PROFITS. Start in basement or garage. LITTLE CAPITAL NEEDED. QUICK, EASY, NO PREVIOUS EXPERIENCE NEEDED. Rubber molds for speed production. MAKE YOUR OWN. SAMPLE KIT $1.00. Canadian $1.50.

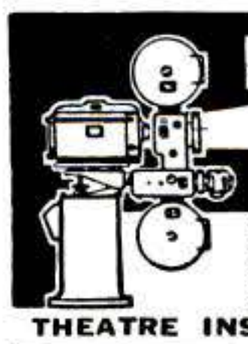
PLASTIC ARTS STUDIOS, Route 5, Dept. 45, Muncie, Ind.

BE A REAL ESTATE BROKER
PAYS BIG!

EASY TO LEARN—Start and run your own business *quickly.* Many graduates report making up to $1000 a month. Course of study covers *Sales, Property Management, Appraising, Loans, Mortgages* and hundreds of related subjects. Course offered in home study or classroom—Both G. I. Approved. *Send post card today for big new illustrated book from this nationally known school.* **Dept. 11**

FREE BOOK TELLS HOW

WEAVER SCHOOL OF REAL ESTATE, 15 E. Pershing Road, Kansas City 8, Mo.



LEARN MOVIE PROJECTION
THEATRE MANAGEMENT

The Motion Picture Theatre Business offers big opportunities for trained men. Get into a fascinating field with a promising future. Train at home in spare time. Free Catalog. Established 20 years.

THEATRE INSTITUTE, 385 Washington St., Elmira, New York

Learn LANDSCAPE GARDENING

A thorough, interesting, home study course for those who wish to become Landscapers, Gardeners, Designers, etc., for profit or pleasure. Write today for **Free Book** to

APPROVED FOR VETERANS — **NATIONAL LANDSCAPE INSTITUTE**
Dept. PS-11, 310 So. Robertson, Los Angeles 36

Learn BAKING *At Home*

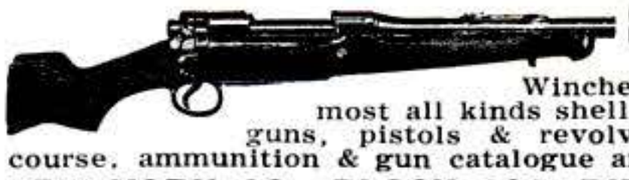
Baking is one of America's high industries in wages. Nearly depression-proof. Thorough basic home course lays sound foundation. If you have aptitude, write for FREE BOOKLET, "Opportunities in Commercial Baking."

National Baking School, 1315 Mich. Ave., Dept. 1368, Chicago 5

SELL MERCHANDISE *by Mail*

OPERATE Profitable Lifetime Business Selling Merchandise by Mail. Large Profits on Fast Selling $1.00 Items. **WRITE TODAY!**

POWELL CO. DEPT. C SAMRLINER BLDG., *CLEVELAND 3, OHIO*



8 mm Mauser-9 mm Luger

Winchester & Remington ammunition most all kinds shells & cartridges for rifles, shotguns, pistols & revolvers. Send $1 for gunsmith course, ammunition & gun catalogue and journals.

NEW YORK CO., BLOCK 300, RIDGEWAY, PENNSYLVANIA

NEW HELP FOR RUPTURE!

is the amazing Treatise which explains simple, inexpensive, easy, proven way for curbing your rupture, right at home. This proven way has helped many rupture sufferers quickly. So don't let your rupture get worse. Send for FREE details today. Mailed to you in plain sealed envelope. No obligation.

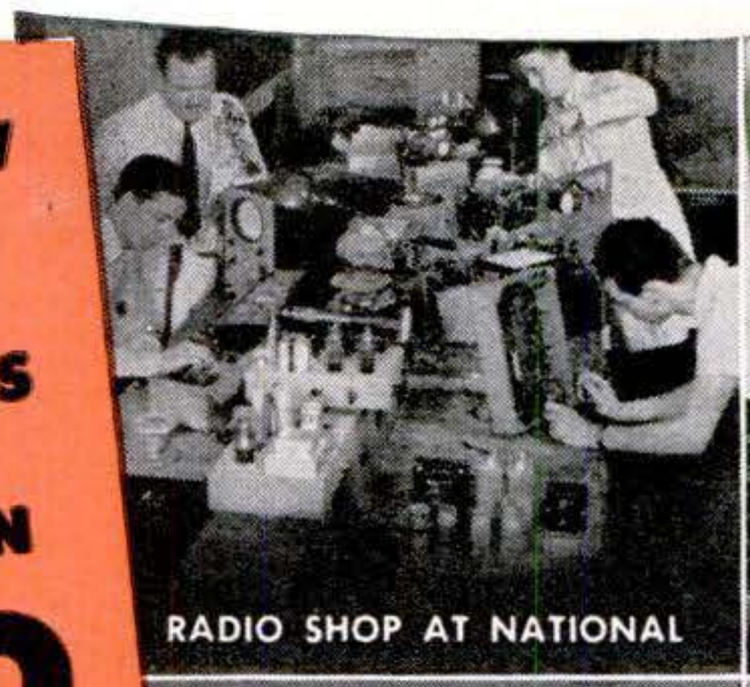
BRADNER PUBLISHING CO. (Established 1933) Dept. G-2 Dixon Ill.

Copyrighted material

OPPORTUNITY NOW FOR *You*

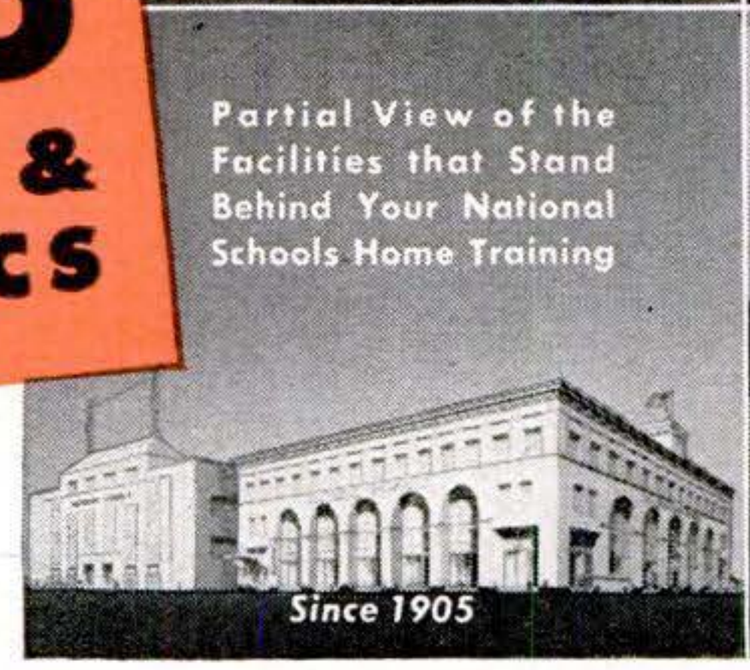
NATIONAL SCHOOLS SHOP METHOD HOME TRAINING IN

RADIO TELEVISION & ELECTRONICS



RADIO SHOP AT NATIONAL

BROADCAST STUDIO AT NATIONAL

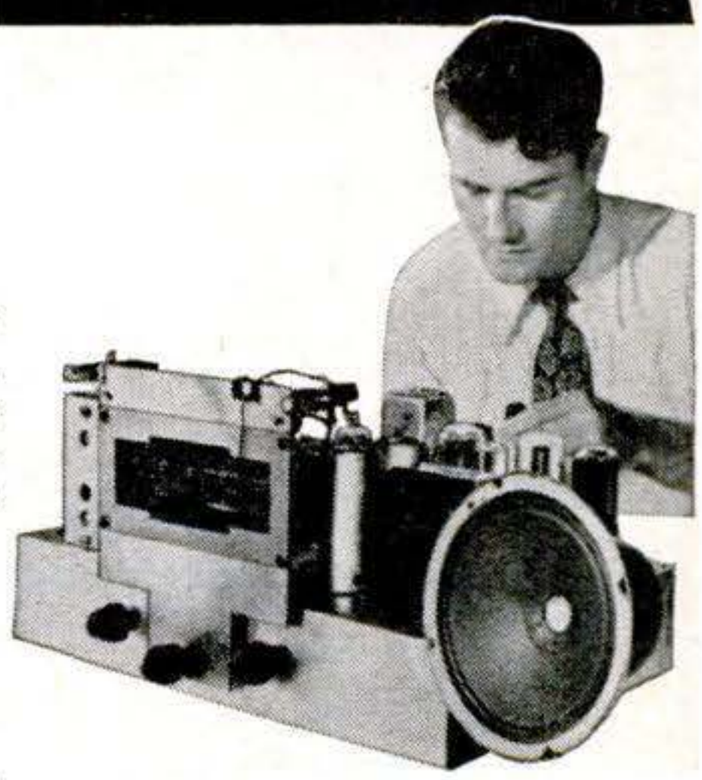


TELEVISION STUDIO AT NATIONAL

A PRACTICAL RESIDENT TRADE SCHOOL

WITH ITS OWN SHOPS AND LABORATORIES FOR OVER 40 YEARS

Today, opportunity in the Radio, Television and Electronics industry are growing from day to day. The fields of Home Radio Service . . . Television sales and service . . . Electronics . . . Radar . . . Radio aboard ships and airplanes . . . Frequency Modulation in Broadcasting . . . all are becoming more important. The list of Radio applications is endless, and every one represents increasing opportunities in our modern world for the *Radio, Television,* and *Electronics Technician with a Solid Technical Background.*



NOT JUST ANY TRAINING WILL DO

It is not a question of opportunity but rather how to take advantage of existing opportunity. Only proper training can make these opportunities a *reality*. National Schools of Los Angeles, one of the oldest and largest technical trade schools in the United States, *offers you Shop Method Home Training, a proved method that builds qualified technicians.* Here is Home Training that BRINGS RESULTS.

Behind *all* training from National Schools stands a permanent faculty of experienced instructors and engineers. These men are daily teaching resident students right in our own Shops and Laboratories. From first hand experience with students here at school, our instructors understand the needs and ambitions of men like you. All of our instructors, both Home Study and Resident, have ideal facilities to make your training practical, up-to-the-minute, interesting. It takes years of experience to know how to train men, especially in the practical technical trades. Established almost 50 years ago, National Schools has a rich background of experience to help you to take full advantage of the opportunities in the Radio, Television and Electronics Industry.

YOU GET ALL THIS RADIO EXPERIMENTAL EQUIPMENT TO USE AND KEEP AT HOME

Learn by Doing is the basic principle of National's Shop Method Home Training. We send you standard Radio parts for an interesting series of experiments, which demonstrate the fundamentals of Radio, Television and Electronics. You build many different types of circuits, a fine, long distance **Modern Superheterodyne Receiver,** signal generator, low-power Radio transmitter, audio oscillator, etc. This **practical work** develops your knowledge of Radio step-by-step, makes you a **practical** Radio technician.

G. I. APPROVED

VETERANS

During the war, National trained enlisted men under contract with the War Department. Both the Armed Forces Institute and Marine Corps Institute used our lesson texts on a wide scale. Now, we are training veterans, both resident and home study, through the Veterans Administration. If you are a veteran of World War II—and qualified for training under the G. I. Bill of Rights, check the coupon for special information.

NATIONAL SCHOOLS

LOS ANGELES 37, CALIFORNIA EST. 1905

MAIL OPPORTUNITY COUPON FOR QUICK ACTION

National Schools, Dept. 11-PS
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope or paste on penny postcard.)

Mail me FREE the books mentioned in your ad including a sample lesson of your course. I understand no salesman will call on me.

NAME..... AGE.....

ADDRESS .....

CITY..... ZONE.... STATE.....

☐ Check here if veteran of World War II

Copyrighted material

OPPORTUNITIES AHEAD

For Men Who are Trained in

AUTO BODY & FENDER WORK

Men 18 to 60. Want a future with good pay, perhaps a business of your own later? If you are mechanically inclined, start now to learn to become an auto body mechanic and fender repair man. This fast growing field has great possibilities for trained men with experience. U.E.I. spare time, home-study training combined with actual shop practice gives you sound, basic knowledge of latest, best methods so you may get the experience which may bring you big pay. Capable instructors supervise your studies and actual practice. Course includes acetylene welding, spray painting, use of hand and power tools, etc.

THOROUGH, RELIABLE TRAINING

U.E.I. has trained men for new opportunity fields since 1927 and many students are now making good. Auto body and fender repairing is one of the best profit-makers in any garage or service station. Little capital required. . . . placement service, or we will show you how to start your own shop. Get the facts FREE, without obligation. Write today.

Training approved under G.I. Bill

UTILITIES ENGINEERING INSTITUTE

AUTO-CRAFTS DIVISION
2523 Sheffield Ave., Dept. 3117-X, Chicago 14, Ill.

Gentlemen:—YES! I want to get into profitable Auto Body and Fender Repair Work. Please send me FREE FACTS at once.

*Name*_____ *Age*_____

Address _____

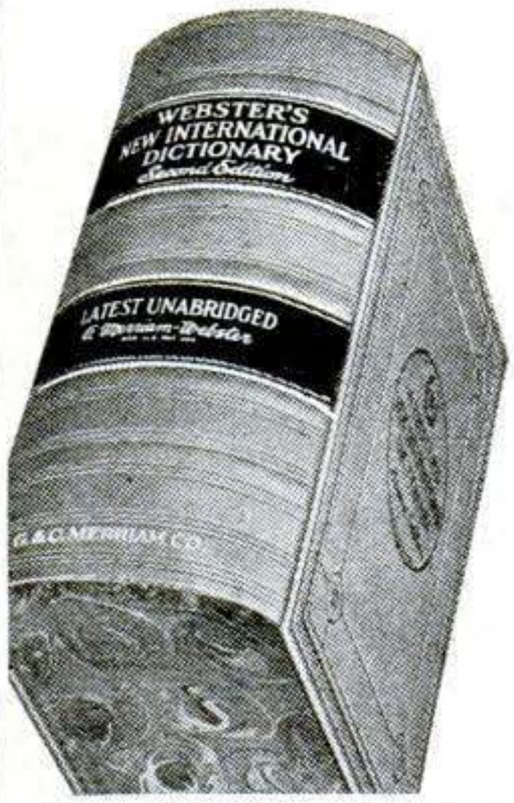
*City*_____ *Zone or County*_____ *State*_____

If veteran of World War II check here ☐
☐ Check here for Special Information if under 17.

"The Supreme Authority"

in courts, schools, homes, newspapers and Government offices

The Merriam-WEBSTER



YOU may have had to wait for a copy of WEBSTER'S NEW INTERNATIONAL DICTIONARY, Second Edition. However, more and more copies are reaching your dealer. See him now. The MERRIAM-Webster contains 3,350 pages, illustrations for 12,000 terms, and a total of 600,000 entries—122,000 more than any other dictionary. It is the only unabridged dictionary completely revised and rewritten in three decades. G. & C. Merriam Co., Springfield 2, Mass.

1847 A CENTURY OF PUBLISHING MERRIAM-WEBSTERS **1947**

WEBSTER'S NEW INTERNATIONAL DICTIONARY • Second Edition

AVIATION

Aeronautical University Approved Training meets exacting standards of aviation industry, prepares for key positions, big opportunities.

Courses in:

AERONAUTICAL ENGINEERING. B.S. degree.
AERONAUTICAL ENGINEERING DRAFTING
CERTIFIED ENGINE MECHANICS
ADMINISTRATION—including sales

PRE-ENGINEERING: Special refresher courses in math and science for high school graduates and veterans.

Also refresher courses for Gov't. Airplane and Engine Mechanics Licenses for those with aviation experience.

Oldest fully approved aviation school. Outstanding faculty, modern equipment, outside employment, placement service. Day, evening. Approved for Veterans. Send today for **FREE** catalog "Opportunities in Aviation."

AERONAUTICAL UNIVERSITY
Dept. 87, 116 S. Michigan Avenue, Chicago 3, Illinois

FOUNDED BY CURTISS-WRIGHT

ELECTRICAL TRAINING

Intensive 32 weeks residence course in fundamentals of industrial electrical engineering, including radio, electronics. Prepares for technician, engineering aides. Approved for veteran training. 54th year. Write for catalog.

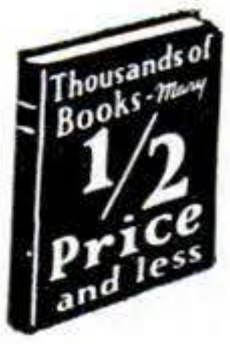
BLISS ELECTRICAL SCHOOL
7620 Takoma Ave., Wash. 12, D.C.

PHOTOGRAPHY *for* PLEASURE *or* PROFIT

Qualify at Home! Learn expert photography as a joy-full hobby, or to qualify for a well-paid position or your own studio. Previous experience unnecessary with N.Y.I.'s success-proved home study training. Details FREE. Also resident courses.

NEW YORK INSTITUTE OF PHOTOGRAPHY, Dept. 5
10 West 33 St., New York 1, N. Y. (38th Year)

ANY BOOK IN PRINT



Delivered at your door. **We pay postage.** Standard authors, new books, popular editions, fiction, reference, medical, mechanical, children's books, etc. **Guaranteed savings.** Send for Clarkson's 1947 catalog.

FREE Write for our great illustrated book catalog. A short course in literature. The buying guide of 300,000 book lovers. The answer to your Christmas gift problem. **Free if you write now—today!**

CLARKSON PUBLISHING COMPANY
Dept. PS7, 1257 So. Wabash Ave., Chicago, Ill.

CORRESPONDENCE COURSES IN RADIO and ELECTRICAL ENGINEERING

Tuition $25

ELECTRICAL ENGINEERING. Get good grasp of wide electrical field. Modern. Very understandable. Theory made easy.

RADIO ENGINEERING. Extra fine course in radio, public address, photo-electric work. Trains you to be super-service man, real vacuum tube technician. Tuition ONLY $25. either course. Deferred payment plan. Servicemen needed badly.

FREE Write for free copies of school catalogs, student magazines, etc.

LINCOLN ENGINEERING SCHOOL, Box 931-S-107
LINCOLN, NEBR.

Thrilling Work COLORING PHOTOS

Fascinating vocation learned at home by those with aptitude. Thrilling pastime. National method brings out life-like colors. Free booklet.

NATIONAL PHOTO COLORING SCHOOL
1315 S. Michigan, Dept. 1368, Chicago 5

TRAIN

Your VOICE!

Results GUARANTEED

We build, strengthen the vocal organs—not with singing lessons—but by sound, scientifically correct silent and vocal exercises and **absolutely guarantee** complete satisfaction with results. Write for Voice Book, FREE. Sent to no one under 17 years old unless signed by parent

Perfect Voice Studios, Studio 1368, Kimball Hall Bldg., Chicago 4, Ill.

Copyrighted material

Have you considered a career in PLASTICS?

A job with a promising future goes a long way toward making you happy —at work and at home.

Do you know of the fine opportunities for advancement that are available in the plastics industry? Do you want to share in the development of a great new plastics era? *Trained men,* who have plastics know-how, will fill the well-paying positions in the industry. If YOU want to be one of them act NOW to prepare yourself.

Every day you can read glowing descriptions of how plastics are improving old products and creating new ones. Learn the hundreds of interesting phases of the plastics industry and be ready for the position that will give you the security and satisfaction you want.

EXCLUSIVELY PLASTICS—Plastics Institute is America's oldest and largest educational organization which devotes all of its facilities exclusively to plastics. *IMMEDIATE ENROLLMENT* can be arranged. Write for information *today!*

COMPLETE COURSES—You learn the various phases of plastics from these courses . . . materials, designing, molding, fabricating, laminating and testing. You acquire a basic knowledge of plastics that can be invaluable to you in acquiring the type of position you want.

YOU MAKE THINGS—We supply materials. To give you practical experience in working with plastics, we supply handsome, colorful rods, sheets and tubes of plastics from which you make useful, attractive creations. You form, dye, decorate, cast and laminate various types of plastics. You also design and develop your own ideas. You can make and sell plastics articles to earn while learning.

START YOUR FUTURE TODAY—Mail the coupon below, now! You will get an interesting, illustrated, free booklet with valuable information about plastics. Get complete details about the world renowned Plastics Institute Resident School, located in beautiful Southern California. Also learn about the comprehensive Plastics Home Training Course, which prepares you for a future in plastics while you continue your present job. Clip this coupon and mail it TODAY!

Write Dept. PS7-11, 1601 S. Western Ave., Los Angeles 6, California

Home Training Courses and Resident School APPROVED FOR VETERANS

Plastics

INDUSTRIES TECHNICAL INSTITUTE

NEW YORK CHICAGO LOS ANGELES

PLASTICS INSTITUTE in the heart of sunny Los Angeles. Here modern laboratories and shops give Resident School students facilities for practice on the finest of industry-type plastics equipment. Also the headquarters for HOME TRAINING.

Plastics Industries Technical Institute
Dept. PS7-11, 1601 S. Western Ave., Los Angeles 6, Calif.

Mail in Envelope or paste on penny postcard

Gentlemen: Please send me the booklet "World of Plastics" and information on your Resident School Courses ☐ Home Training Courses. ☐ I understand there is absolutely no obligation.

Name (PRINT) ..... **Occupation** .....

Street (PRINT) ..... **Age** .....

City ..... **Zone** ..... **State** .....

Important: Please fill out coupon *completely.* If Veteran, please check. ☐ If in Armed Services now, please check. ☐

FREE BOOKLET
Send For It Today!

Copyrighted material

WAR SURPLUS GADGETEERS PARADISE

The perfect HE-MEN'S Christmas gifts for sportsmen, campers, fishermen, hunters, scouts and gadgeteers. Write for free booklet.

NAVY COLD-WEATHER PANTS

Tough jungle outer cloth. 100% wool flannel lining. 2 Front pockets, 2 hip pockets. Ideal for working outdoors in zero temperatures. Perfect for hunters and fishermen. This item will disappear from the market soon, order a few pairs now. Small, medium and large sizes..... **$4.95**

BROWN LEATHER SHEEP LINED FLYERS PANTS

Front pockets, zippers at side and fly, suspenders. Perfect garment for hunters and outdoor men. Sizes from 36 to 44. (Original government cost —$22.50). **$6.95**

AIR PUMP

Originally intended for inflating rubber boats. You have been looking for this scarce item, here's your chance to get one. Will attach to any size boat inflation valve..... **$4.95**

GLIDER COVER

O.D. color, 5' across top, 14' across bottom, approximately 8' in length. Lined inside with white cotton felt cloth. Perfect for covering trailers, small boats, garden furniture, sand boxes. Fitted with grommets and rope..... **$4.95**

AIR CORPS SHEEP LINED LEATHER GLOVES

Doeskin outer cover that would cost $12.00 to manufacture today. Mitt type with separate trigger finger—ideal for cold weather hunting. **$5.95**

POCKET TOOL CASE

Will hold 8 essential tools, easy to keep in the glove compartment of your car. Genuine leather construction with snap fasteners.

59c

JUNGLE HAMMOCK

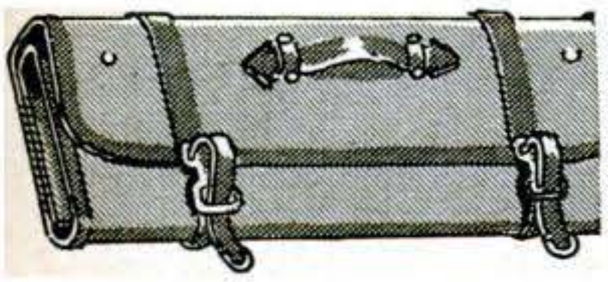
Ideal for camping, home or resort use. Waterproof roof, mosquito-proof, nylon netting side. Just the thing for outdoor sleeping..... **$7.95**

TRENCH SHOVEL

Use it as a shovel or pick around the home, the farm, or cottage. Sturdy and well made..... **98c**

GOGGLES

Polaroid goggles with 1 extra flexible shatter-proof lens. Rubber frame and adjustable head-strap. Packed complete in box. Dustproof. For hunters, fishermen, flyers, etc. **$1.49**



ROLL-UP TOOL KIT

Heavy canvas construction, closes with two web straps and buckles. Thick leather reinforced carrying handle. Opens into 24 x 36" with two extension flaps, each 14" long. Folds into compact 24 x 36" case. Ideal for mechanics, garagemen, or anyone carrying tools. Brand new..... **$1.98**

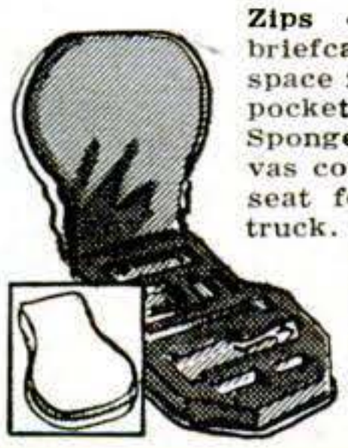
UTILITY ZIPPER CASE

Of sturdy canvas, with carrying handle attached. Will make excellent small camera case with extra pocket for film. Small tool kit, handy toiletry case, fishing kit or shell case. Hundreds of uses. 7½" long, 3" wide, 4½" deep **69c**

150-Lb. TEST NYLON CORD CONE

125 feet long, perfect fishing line for catching "the big ones" **$1.50**

SEAT CUSHION



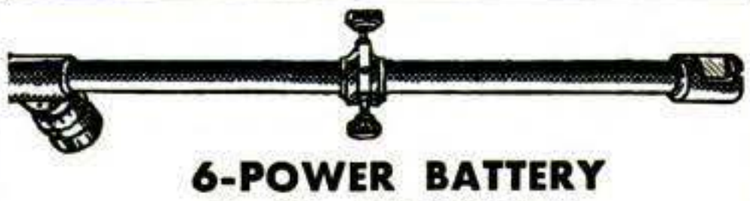
Zips open like a briefcase to provide space for toiletries, pocket knife, etc. Sponge rubber, canvas cover. Full size seat for boat, car, truck. 17" at widest point. 19" point; 11" at narrowest long. 2" thick. **$1.75**

3X GUN SIGHT

Precision optical instrument; powerful achromatic color corrected lens; waterproof, dustproof, shockproof. All bronze and brass body; a find for bird and nature study, long distance observation. 22½" long. Gov't. cost approx. $175.00. **$4.95 Each**

4-POWER PANORAMIC SCOPE

Revolving head telescope; finest prisms and lenses. Contains 90 prism in worm E) gear mounting 11/16 sq. by 3" Dove Prism in worm E) gear mount. Head revolves 360 on double bevel gears. Achromatic objective and Kellner eyepiece, 90 Amic (Roof) Prism. Adjustments controlled and protected. Water, dust and shockproof. A real buy..... **$7.95**



6-POWER BATTERY C. O. TELESCOPE

All-prism type instrument, 6 lenses perfectly ground, clear, flat, color-corrected field of vision. Adaptable as right-angle view finders for cameras. Gov't. cost over $300..... **$11.95**

RIFLE CASE

Heavy lifetime canvas construction, with extra sturdy, full length zipper. Metal bracket inside to hold rifle in place. Will take almost any shotgun or rifle.. **$2.95**

ELBOW TELESCOPE

3-power, field view 13 degrees, 20 minutes. Achromatic, color-corrected. Can be converted by shopmen to a "center-scope" for drill press, jig and tool work. Lens suitable for photography and microscopes. Gov't. cost approx. $150... **$6.95**

PORTABLE EXTENSION FLASHLIGHT

Uses 2 dry cell batteries. Excellent for mechanics who need to get light into close quarters, etc. O. D. color. Has rheostat to regulate brightness of light. Sold without batteries.... **$2.95**

MACHETE

Eighteen inches long, tempered steel blade, wood or plastic handle with pole for thong..... **$1.98**

STRAIGHTEDGE

Bright steel, square edge 24" long, 1½" wide. Graduated in yards 1 to 20,000. Originally manufactured for the Engineer Corps at gov't. cost of $3.37 each.... **98c**

100% WOOL SLEEPING BAG

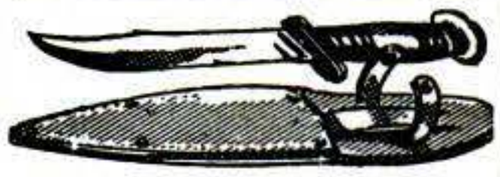
Ideal for vacations, camping. Blanket-type with 30-in. Talon zipper. Renovated —AA1 like new..... **$2.95**

AIR CORPS TYPE SUN GLASSES

Made to highest optical standards. Meet all U. S. govt. specifications for absorbtion of ultra-violet and infra-red rays. Air Corps type glasses. **$2.98**

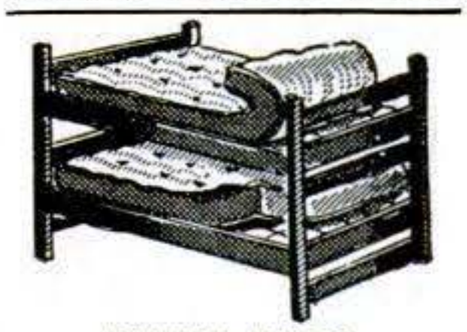
MUSETTE BAGS

Army type, shoulder carrying bag, re-issue, perfect condition. Heavy OD canvas. 12x12". 6" deep..... **98c**



HUNTING KNIVES

High quality hunting knives with hardened steel blades. Perfect for trips of all kinds. 4½" blade, $2.49. 6" blade... **$2.98**



BUNK BEDS $8.95

Sturdy hardwood. O.D. color In excellent condition, to be used as a double-deck bunk or twin bed combination. Mattress not included.

MESS KIT

Regulation, two-piece Army mess kit. New. For picnics and camping.

69c

72" BALLOON

Target type. Air Corps balloon. Black rubber. Inflates up to 72 inches.... **98c**

SPARK PLUGS

Brand new Firestones, from gov't. surplus. Each plug wrapped and boxed separately. Sizes: '46 Chrysler '41-'42 Crosley '46 De Soto '46 Dodge '40 Graham '38-'46 Hudson '34-'37 Hudson '32 Super 6 Hudson '41-'42 Olds '46 Plymouth '40-'42 Plymouth '35 Pontiac High Comp. '42-'46-'47 Studebaker '40-'42 Willys **37c Each**

SURPLUS DISTRIBUTORS

924-B. N. Plankinton Ave. **Milwaukee 3, Wis.**

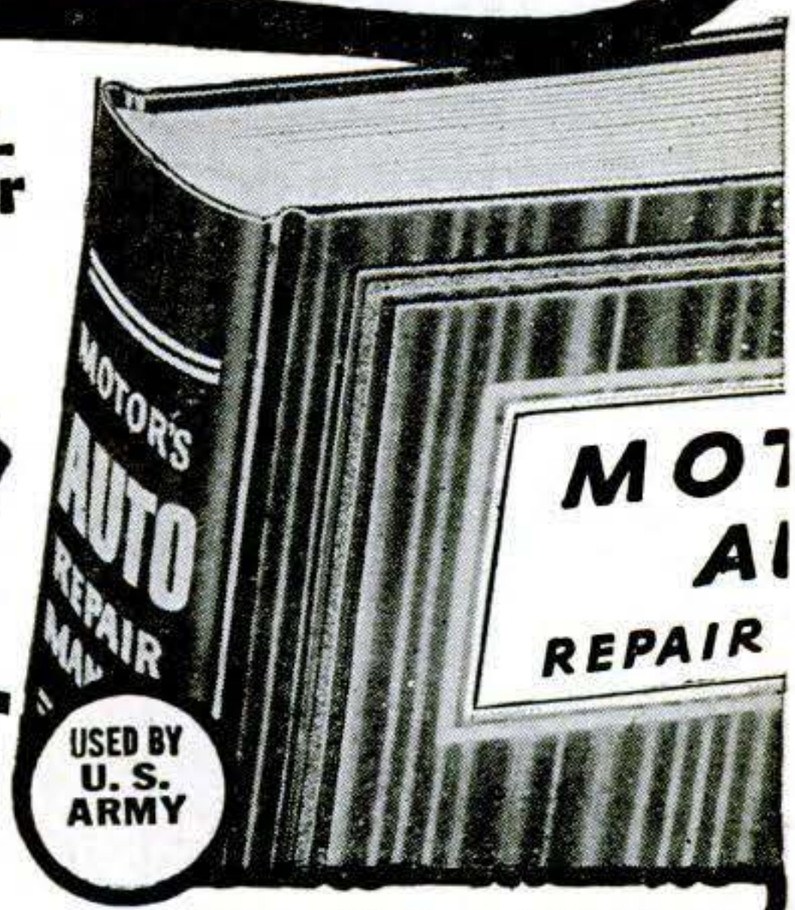
Mail orders promptly filled. Send money order or check . . . add 25c for postage and handling. On COD orders enclose 25% deposit, balance plus postage on arrival. Money cheerfully refunded if not satisfied.

Copyrighted material

Now ANY AUTO REPAIR JOB Can Be "*Duck Soup*" For You!

MoToR's New AUTO REPAIR MANUAL Shows You How to Service and Repair ANY Part of ANY Car!

FREE 7-DAY OFFER!



USED BY U. S. ARMY

NOW you can "polish off" the HARDEST jobs the EASIEST way! MoToR's AUTO REPAIR MANUAL is ready to show you how to repair anything from carburetor to rear end—with the *least* possible amount of time and effort!

Suppose plain-talking car engineers from every auto plant in America got together and showed you all the things you needed to know about repairing and servicing the cars *they* had designed and manufactured! That's really what you get in this big manual! Right at your fingertips, the main "dope" from *150 Official Factory Shop Manuals*, covering every make car built since 1935!

Easy to use, too! Quick-index leads you to right page in jiffy! Just follow simple instructions step-by-step.

SEE HOW MUCH YOU GET!

856 pages, 8½x11 inches, bound in sturdy covers. 200,000 service, repair, adjustment, replacement, tune-up facts on all makes and models, built from 1935 through 1946! More than 1000 cut-away photos, diagrams, drawings show you exactly WHAT to do and HOW to do it. Used by U. S. Army, trade and technical schools everywhere, thousands of auto servicemen.

Now YOU — without cost —can see for yourself what a wonderbook MoToR's Auto Repair Manual really is. Try it—FREE—for 7 days! Learn first-hand how it can pay for itself the first few times you use it.

SEND NO MONEY

7-Day Free Examination

Just mail coupon at right, without money! When the postman brings your book, pay him nothing. First make it show you what it's got! Unless you agree this is the greatest time-saver and work-saver you've ever seen —return book in 7 days and pay nothing. Mail coupon today! Address: MoToR Book Dept. Desk 2N, 572 Madison Ave., New York 22, N. Y.

Published by MoToR. The Leading Automotive Business Magazine. MoToR's manuals assure high standards of repair work.

Covers All These Makes!

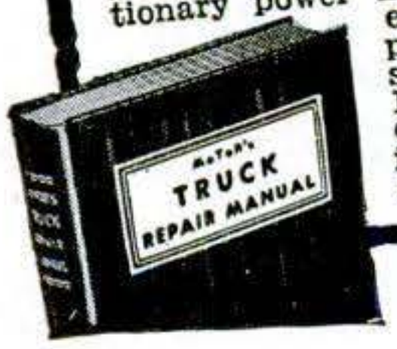
American Bantam
Auburn
Austin
Buick
Cadillac
Chevrolet
Chrysler
Cord
Crosley
De Soto
Dodge
Ford
Graham
Hudson
Hupmobile
Lafayette
La Salle
Lincoln
Lincoln Zephyr
Mercury
Nash
Overland
Oldsmobile
Packard
Pierce Arrow
Plymouth
Pontiac
Reo
Studebaker
Terraplane
Willys

Clear, Pictured Facts on Every Job on Every Car Built Since 1935!

Nearly 200,000 service and repair facts on all 31 makes. 856 big pages; including 50 pages of carburetor text, charts, illustrations, covering all models. Over 500 charts, tables; Tune-up Chart; Valve Measurements; Compression Pressure; Torque Wrench Reading; Starting Motor; Engine Clearances; Generator; Clutch & Brake Specifications; Front End Measurements, etc., Engines; Electric, Fuel, Cooling, Lubricating Systems; Transmissions; Universals; Front Ends; Wheels; Rear Ends, etc.

Same FREE 7-Day Offer Applies on MoToR's TRUCK REPAIR MANUAL

For mechanics, truck specialists, service stations, fleet owners. Covers EVERY job on EVERY truck made since 1936! 1400 pictures, 952 pages, 300,000 facts. Used by Armed Forces. All types Gasoline Engines, Diesels, Hesselman, Fuel Systems, Governors, Lubrication Systems, Ignition Systems, Starters, Generators, Clutches, Transmissions, Axles, Torque Dividers, Transfer Cases, Brakes, Steering, etc. ALSO SERVICES buses, farm and industrial tractors, contractor and road building equipment, stationary power machinery, etc. (on all parts described in Manual.) Check box in coupon at right.



MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR Book Dept., Desk 2N, 572 Madison Ave., New York 22, N. Y.
Rush to me at once: (check box opposite book you want)

☐ **MoToR's AUTO REPAIR MANUAL.** If O.K. I will remit $1 in 7 days, (plus 35c delivery charge), then $2 monthly for 2 months, with a final payment of 95c one month later. (Book's price $5.95). Otherwise I will return book postpaid in 7 days. **(Foreign price, remit $8 cash with order).**

☐ **MoToR's TRUCK REPAIR MANUAL.** (Described at left.) If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment ($8.35 in all). Otherwise I will return book postpaid in 7 days. **(Foreign price, remit $10 cash with order).**

Print Name _____ Age _____

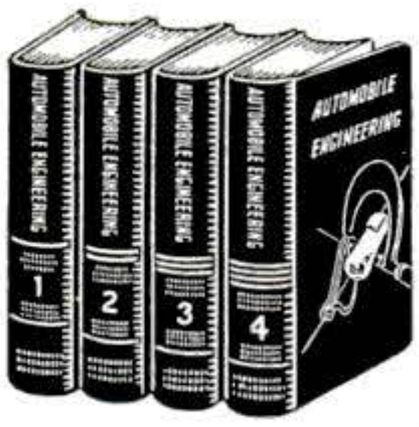
Print Address _____

City _____ Zone No. (if any) _____

State _____ Occupation _____

☐ **SAVE 35c!** Check here if enclosing full payt. (check, m.o.) WITH Coupon. We pay 35c shipping costs. Same 7-day return-refund privilege.

Copyrighted material



AUTO BOOKS ON APPROVAL

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this FREE EXAMINATION OFFER.

MAKE GOOD MONEY NOW HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the JIFFY INDEX to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile engineers. Many hundreds of valuable illustrations. Send the coupon TODAY.

CAN YOU FIX IT?

These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES

Over 2700 pages, 2000 illustrations, wiring diagrams, etc., including Diesel engines. Beautiful modernistic, washable cloth binding.

[A year's consulting privileges with our engineers now given with these books without extra charge.]

Vocational Publishers Since 1898

AMERICAN TECHNICAL SOCIETY, Dept. A820
Drexel Ave. at 58th St., Chicago 37, Ill.

I would like to examine your 4 Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you $2 and pay the balance at the rate of only $3 a month until $24.80 has been paid. Include consulting service as offered above.

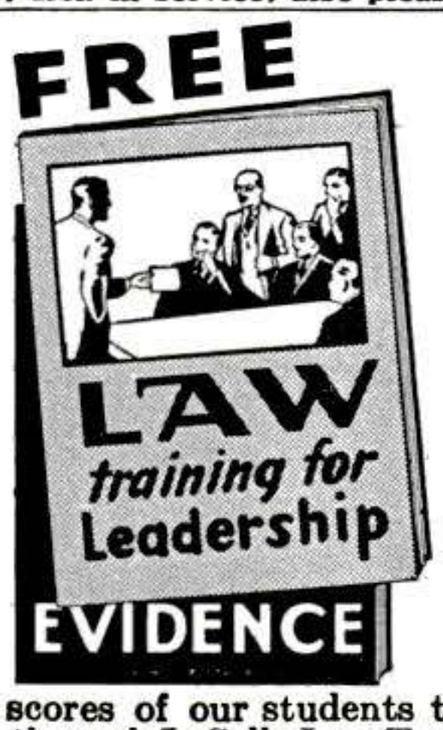
Name.....

Address.....

City.....State.....

Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

FREE TO the MAN INTERESTED IN LAW



Every question about Law and its value to you is answered in LaSalle's 48-page booklet, "Law Training for Leadership." And the question of *how* you can master Law is answered in the companion booklet, "Evidence"—in which scores of our students tell how they have advanced through LaSalle Law Training in spare hours at home.

Legal training gives you what the business and professional world prizes highly and rewards liberally—a keen, analytical mind, the ability to judge shrewdly, talk convincingly, and act with confidence.

LaSalle's "Problem Method" of personalized instruction by lawyer-instructors gives you practice in handling legal problems . . . you *learn by doing*, not by memorizing rules. We guide you step-by-step, furnish all texts, including remarkable 14-volume Law Library prepared by leading law professors and lawyers, and used as reference in many Law libraries and offices. Degree of LL.B. conferred. Low cost, easy terms.

Investigate *your* opportunities in Law. Mail coupon today for free booklets described—without obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 1183-L Chicago 5, Ill.

Send me "Law Training for Leadership" and "Evidence"—without obligation.

Name.....*Age*.....

Street.....

City, Zone & State.....

Practical Shop Training In REFRIGERATION

Service, Maintenance, Installation and AIR CONDITIONING

• Domestic • Commercial • Industrial

Approved for G. I. Training

Write for Details
COMMERCIAL TRADES INSTITUTE
202 So. 20th St., Birmingham, Ala.

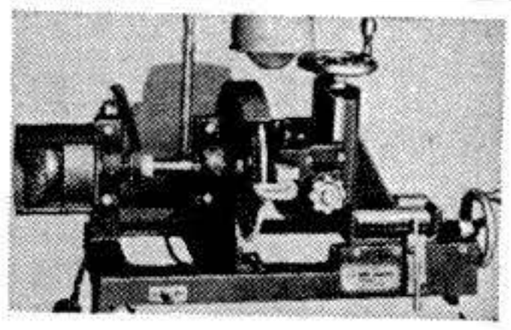
. . Train in the Magic City of the South. .

TRI-STATE COLLEGE

B.S. Degree in 27 months in Civil, Electrical, Mechanical, Chemical, Aeronautical, Radio Engineering, Bus. Admin., Acctg. and Sec. Science. **64th year.** Enter Jan., March, June, Sept. Catalog. **5117 College Ave., Angola, Ind.**

INDIANA TECHNICAL COLLEGE

ENGINEERING B. S. DEGREE IN 27 MONTHS. Aeronautical, Chemical, Civil, Electrical, Mechanical and Radio Engineering (inc. television). Drafting, 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states. Demand for grads. Enter Dec., March, June, Sept. Catalogue. **6117 E. Washington Blvd., Ft. Wayne 2, Ind.**



Start a NEW BUSINESS

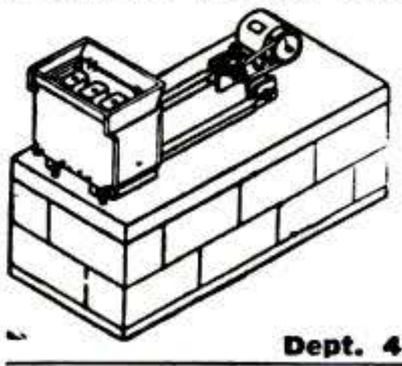
Sharpen Dull Pipe Wrenches

Or Add to Your Present Repair Business

Write for information.

J C. MOORE INDUSTRIES P.O. Drawer 276 FREDONIA, PA.

BUILD THIS CONCRETE BLOCK MACHINE



Sell blocks; or build your home, garage, barn, or filling station at 1/3 cost by making and laying your own blocks.

This simple machine which you can build yourself at a cost of $15 (excluding motor) will make a block in 30 seconds using only one form. Mass production can be achieved by a new simple method of removing blocks which allows two to four forms to one vibrator. Power driven concrete mixer plans also. Send dime for details and "How to Make and Lay Blocks" folder.

U-BUILD-IT SERVICE
Dept. 4-A, 206 West Wilder St., Tampa 3, Florida

DECAL SLIDE-ON SIGN LETTERS & NO'S.

Ideal for trucks and windows. Red, Yellow, Silver, Creme, Black. 4½-in. 7c, 3-in. 5c, 2-in. 4c. Guaranteed. Add 10c postage for less than $1.00 orders. State color and size.

PINNACLE SIGN LETTER CO. Dept. B MOUND CITY, ILLINOIS

HYPNOTIZE ANYONE

• Yes, anyone in 5 seconds. Secrets revealed. Exciting experiments. Overcome inferiority complexes, excessive smoking, alcoholism, stuttering, nailbiting, phobias, insomnia, fear, manias, stagefright. Improve your memory and concentration. Private and class instruction available at Institute. Complete practical home-study course. . . . $2

POWERS INSTITUTE OF HYPNOTISM 2932 Wilshire Blvd. Dept. 20, Los Angeles 5, Calif

AGENTS 300% Profit SIGN LETTERS

For Store Fronts and Office Windows. Anyone can put them on. Free Samples. Liberal Offer to general agents.

METALLIC LETTER CO., 441 N. Clark, Chicago 10

NEW CHEMICAL MITT

Sensational! DRY Window Cleaner! Uses no water, no messy liquids. Chemically Treated. Simply glide over windows; leaves glass sparkling clear. No heating water, no heavy buckets to carry. No rags, powders, sponges, chamois. No mess or muss. No red chapped hands. Dust, dirt, grime, fog disappear like magic. *Wonderful for auto windows, windshields!*

SAMPLES FOR AGENTS Sample offer sent immediately to all who send name at once. A penny postal will do. SEND NO MONEY—*just your name.* **KRISTEE CO., 694 Bar Street, AKRON, OHIO**

Copyrighted material

IMAGINE THEIR JOY

WHEN THEY FOUND THEY COULD PLAY

This easy as A.B.C. way!

PLAYS ON RADIO

"As a proud student I can't keep from telling you that as a result of my course I have a good position playing from KTHS, Hot Springs, Ark., every morning."
*J. S., Okla.

LEARNED QUICKLY AT HOME

"I didn't dream I could actually learn to play without a teacher. Now, when I play for people they hardly believe that I learned to play so well in so short a time."
*H. C. S., Calif.

INVESTMENT PAID BACK A THOUSAND FOLD

"Anyone with musical ability should make good with your course. My little investment paid back a thousand fold. I have been playing for 4 years now. Today I play in one of our top bands."
*J. M., San Juan, P.R.

PLAYS AT DANCES

"I have completed your course and your lessons have been most satisfactory. I can play all of the popular songs. I have also earned money playing at dances."
*E. N. J. New York.

INVITED TO PARTIES

"I enjoyed taking this course and I get a lot of pleasure out of it. I have made much progress and have many invitations to play at parties. I owe you much for making this possible."
*K. U., N. Y.

Thousands Have Learned to Play Quickly, Easily at Home

WHAT instrument would you like to play? We'll show you how you can learn to play it—quickly, easily, in spare time at home for only a FEW CENTS A DAY! Never mind if you don't know one note of music from another—don't worry about our "special talent."

The truth of the matter is that **thousands now play who never thought they could!** Yes, men and women everywhere are enjoying the thrilling satisfaction of playing the piano, violin, guitar, saxophone or other favorite instrument. Some of them are playing in orchestras and over the radio; others are teaching music, making money in spare or full time. And thousands are playing for their own enjoyment and the entertainment of their friends.

It all came about when they wrote to the U. S. School of Music for the Free Booklet that shows you how EASY it is to learn music at home this modern way. No tedious scales, no tiresome exercises. You learn to play **by playing**—start right in almost at once with the melody of a simple tune! It takes only a few minutes a day and the cost is trifling; you save the expense of a private teacher. Does it sound too good to be true? Mail the coupon and get the FREE PROOF! (49th Year). Instruments supplied when needed, cash or credit. U. S. School of Music, 811 Brunswick Bldg., New York 10, N. Y.

NOTICE

Please don't confuse our method with any systems claiming to teach "without music" or "by ear". We teach you easily and quickly to play **real music,** any music, by standard notes . . . not by any trick or number system.

SEND TODAY ➡ FOR COMPLETE DETAILS

• You'll open your eyes when you find how quickly and easily you can learn to play your favorite instrument. Don't doubt; don't hesitate. Send for the fascinating illustrated booklet that answers all your questions; let the free Print and Picture Sample show you how this method actually works. If interested, mail the coupon NOW.

**Actual pupils' names on request. Pictures by professional models.*

FREE! *Print and Picture Sample*

U. S. SCHOOL OF MUSIC
811 Brunswick Bldg., New York 10, N. Y.

I am interested in music study, particularly in the instrument checked below. Please send me your free illustrated booklet, "How to Learn Music at Home."

Piano	Saxophone	Modern Elementary Harmony
Guitar	Trumpet, Cornet	Clarinet
Hawaiian Guitar	Reed Organ	Practical Finger Control
Violin	Tenor Banjo	Other Instrument
Piano Accordion	Mandolin	

Have you Instrument? .....

Name .....
(Please Print)

Address .....

City ..... State .....

NOTE: If you are under 16 years parent must sign coupon.

Save 2c—Stick coupon on penny postcard.

Copyrighted material

For FUN and PROFIT learn to MOUNT BIRDS

AND ALL KINDS OF ANIMALS

SPORTSMEN, SAVE YOUR TROPHIES! Learn at home in spare time to mount all kinds of birds and animals. Decorate your den with trophies of field and stream. We teach you this **FASCINATING SPORTSMEN'S HOBBY.** Quickly, easily learned. Wild game is growing **scarcer.** Trophies now more valuable than ever! Shoot **FEWER** and **MOUNT** them true to life. **IT'S PROFITABLE!** Many report earning $25 to $75 a month mounting specimens for hunters. Why not **YOU?** Learn to make **USEFUL** articles from mounted specimens such as book ends, lamps, etc., etc. (See squirrel lighter to left.)

WILD GAME NOT NEEDED. If you don't hunt you can mount **COMMON** specimens: Owls, crows, pigeons, hawks, rabbits, even frogs. Real **FUN.**

LEARN TANNING We also teach you to tan furs soft and pliable and new method to **TAN GENUINE LEATHER** from all kinds of hides. Great spare time money maker.

FREE BOOK Send right now for beautiful free 48-page booklet, illustrated, telling how easily **YOU** can learn to be a Taxidermy Artist. Contains many fine pictures. Intensely interesting. Get **YOUR** copy today. No cost or obligation. **Send now!** State **AGE.**

N. W. SCHOOL of TAXIDERMY, 9398 Elwood Bldg., Omaha, Neb.

Learn this Profitable Profession

IN 90 DAYS AT HOME

Money-Making Career Open to Men and Women, 18 to 50

Hundreds of men and women between 18 and 50 make $10 to $20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. **There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices.** Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our **nationally known** resident school. **You** can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin **your** training at once.

Anatomy Charts & Booklet FREE

Enroll now and we will include, at no extra cost, many needed supplies. Fit yourself to help meet growing demand for Scientific Swedish Massage. **Send the coupon at once for complete details, Anatomy Charts and 32-Page Illustrated Booklet, FREE, postpaid.**

THE COLLEGE OF SWEDISH MASSAGE
Dept. 770-P, 100 East Ohio St., Chicago 11, Illinois
Please send me FREE and postpaid, Anatomy Charts, 32-page Booklet and complete details on Home Training.

Name.....

Address.....

City.....State.....

5 COURSES TO SUCCESS

CLASSES ENROLLED MONTHLY
Time-saving practical courses—day and evenings. Approved for G.I. Training. Free Placement Service Write for **FREE CATALOG**

- TOOL and DIE DESIGNING
- MECHANICAL DRAFTING
- ARCHITECTURAL DRAFTING
- INDUSTRIAL PROD. DESIGNING
- AUTOMATIC SCREW MACHINE ENGINEERING — Cam Design Layout and Estimating

MIDWESTERN TECHNICAL INSTITUTE
431 S. Wabash, Auditorium Bldg., Dept. YB, Chicago 5, Ill.

OPPORTUNITIES AHEAD! TRAIN FOR A FUTURE IN DIESEL

● Prepare for the big earning power of **Diesel Trained Men.** Start learning at home, in spare time. UEI's easy, practical training covers all phases of DIESEL engine operation, fuel systems, auxiliary equipment, repairs and maintenance. When home course is completed, you come to Chicago for actual shop practice on DIESEL MOTORS under expert instructors, at UEI's fine, modern school.
BEGIN AT ONCE—GET ALL THE FACTS **FREE.** WRITE TODAY!

DIESEL DIVISION UTILITIES ENGINEERING INSTITUTE
2521 Sheffield Ave. • Dept. 3117-D • Chicago 14, Illinois

PATENTS AND TRADE MARKS

C. A. SNOW & CO.

REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
426 SNOW BUILDING, WASHINGTON 1, D. C.

INVENTORS

The question as to whether a subject matter is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write us for full information on what steps an inventor should take to secure a Patent or Trademarks.

RANDOLPH & BEAVERS
Registered Patent Attorneys
905-L Columbian Building, Washington 1, D. C.

INVENTING —FOR PROFIT!

If you have an inventive turn of mind, write for free 28-page booklet explaining how the Institute of American Inventors is helping inventors pre-test the profit possibilities of proposed devices to fill today's unprecedented demand for new inventions.

INSTITUTE OF AMERICAN INVENTORS
Dept. 3. 1926 Eye St. NW. Washington 6, D. C.

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION,
You should take steps to protect it by a U. S. Patent. Write me for "Record of Invention" form.

CARL MILLER
REGISTERED PATENT ATTORNEY

Woolworth Bldg., 35th Floor, Dept. 117C, New York City
Please send me "Record of Invention" form.

NAME.....

ADDRESS

Copyrighted material

DO ANY JOB.. EASIER.. QUICKER
MAKE MORE MONEY in the
BIG OPPORTUNITY FIELDS

SEND NO MONEY
Select the Books YOU Need Now! We Ship C.O.D. Anywhere in U. S. and Will Refund Amount Paid if Not Satisfactory.

Here's the Help You Need For Best Paying Jobs Right NOW!

FREE TRIAL IN YOUR OWN HOME

Used by Army, Navy, Other Government Depts., 200 Schools and Industrial Firms.

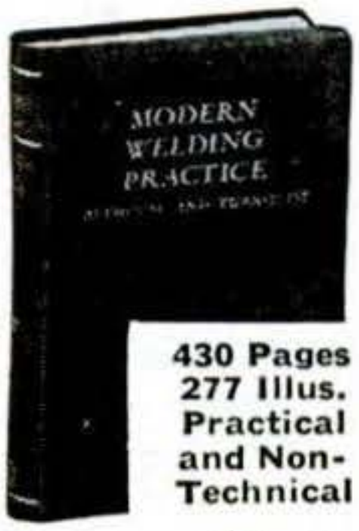
Do it now! Get the better pay that goes to men with specialized knowledge. Get into one of these big opportunity fields. Big money and many other advantages await you if you prepare now. Here is the help you need—EASY—QUICK—AT LOW COST. Thousands of men have already used these famous books. Beginners and experienced men alike have doubled and tripled their earnings with this help. You too, can now get the special knowledge you need for top pay, better jobs, or a business of your own. This is your GOLDEN OPPORTUNITY.

AIR CONDITIONING

Big air conditioning boom interrupted by war now bigger than ever and alive with new opportunities! Get this non-technical book by international authority and be ready for your share of millions to be spent. Covers whole field. 450 pages. Illustrated. $4.00.

HOUSE WIRING
LATEST EDITION

Get this sixth edition of this standard and practical electrical wiring book. It gives complete practical instruction on every phase of house wiring in one handy volume. Goes further than most books on subject. Hand-book style. Gives National Electric Code. 400 pages, 669 illustrations. Electrical work will reach a new high with millions of new homes to be built. Get started now. $3.00.



MODERN WELDING PRACTICE

430 Pages 277 Illus. Practical and Non-Technical

Newest book on all types of welding and heattreatment of metals. Written by recognized specialists in training men for production jobs. **Practical and Non-Technical.** Covers everything you need to know. Prepare for best pay jobs now. Price $4.00.

DYKE'S FAMOUS CARBURETOR BOOK

This famous book has been the standard guide in the best paying auto work for a generation. It has helped thousands of men make money. New edition covers engine tune-up, compression, ignition, carburetion, fuel pump valves, etc. Use this book to specialize in this big field. 244 pages, 549 illustrations. $3.50.

BIG 20th EDITION

Leading Auto Book for Over 36 Years

World's Greatest AUTO BOOK

New Material on Transmissions, Trucks, Tractors, Diesels, Aircraft and Auto Engines

Now with millions of cars needing repairs and thousands of men needed to do the work, you need the famous DYKE Auto Book more than ever before. This big 20th Edition covers all principles, construction, repair, adjustments, testing, troubles and remedies of all cars. Over a half million copies of 20 editions of Dyke's have been sold. Gives specifications of old and newer cars. World's biggest book value. **$7.00.**
This big book, a complete auto library in one volume, has 1483 pages—4600 illustrations and diagrams—weighs 6 lbs.—equal to 4 ordinary books.

SHEET METAL LAYOUT

Makes sheet metal layout work so simple that anyone can learn. Get this new instructor and get into the easiest, cleanest and best paying part of all sheet metal work. 143 jobs worked out in drawings and carefully explained. Gives standard for all sheet metal fittings. $3.50.

AUTO BODY and FENDER REPAIR

Owners will spend big money to keep their good older cars looking like the new ones coming out. This is a practical money-making guide, ideal for shop owners and every man who wants a share of the millions to be spent in keeping old cars looking new. Tells how to get a good job or start business of your own with small capital. 325 pages, 232 illustrations. $3.50.

BAILEY'S HANDBOOK
For Engineers and Firemen

World famous handbook of universal questions and answers for Stationary, Marine and DIESEL engineers and firemen. Prepares for any license examination. This is the one book that men should have if they want to reach the top in installation, maintenance and operation of Diesel and steam plants. Pocket size, $2.00.

Goodheart-Willcox Co., Inc.
2009 S. Michigan Ave., Dept. 39, Chicago 16, Ill.

15 Million Refrigerators Need Service and Repairs

REFRIGERATION—*Book of the Hour!*
Biggest Opportunity in Many Years!

NEW PRINTING—ALMOST 1000 PAGES

408 Pictures—17 Diagrams in Colors Makes All Refrigerator Service Maintenance, Repairs Simple as A. B. C.

Thousands of Refrigerators need repairs! Owners will pay big for competent service which will be needed more and more. Get MODERN GAS AND ELECTRIC REFRIGERATION, the non-technical guide to all types of refrigerators and get your share of this new profit. Get a job or start your own service business. This book will help you make money anywhere. Price $5.00.

SEND NO MONEY! Mail Coupon

GOODHEART-WILLCOX CO.,
2009 S. Michigan Ave., Dept. 39, Chicago 16, Ill.

Send books checked, C.O.D. I will pay postman, plus few cents charges. If not satisfactory I will return books in 5 days and you will refund money paid. (Outside U.S. or possessions remit with order.)

- ☐ Gas & Electric Refrigeration $5.00
- ☐ Dyke's Auto Book $7.00
- ☐ Dyke's Carburetor Book . $3.50
- ☐ Modern Welding $4.00
- ☐ Airplane Welding $3.50
- ☐ Sheet Metal Layout $3.50
- ☐ Air Conditioning $4.00
- ☐ Engineers Handbook ... $2.00
- ☐ Body and Fender Repair . $3.50
- ☐ Shop Math. (2 vols.) ... $3.00
- ☐ House Wiring $3.00
- ☐ A.C. Power Wiring $4.00
- ☐ D.C. Power Wiring $4.00

If remittance accompanies order we will pay all postage charges under same return privilege.

Name _____

Address _____

City _____ State _____

Copyrighted material

ELECTRICIANS

Get this Great Book FREE

Book of 150 Shop Prints, Wiring Diagrams, Full Size 8½" x 11"

For Merely Examining Coyne's NEW Pay Raising

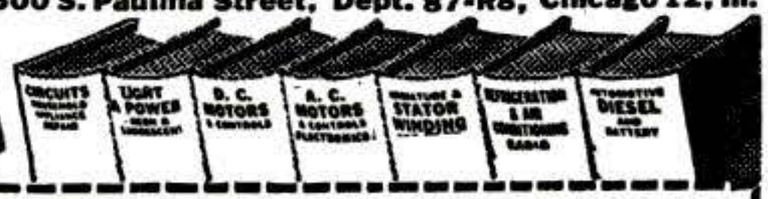
7 Volume Set APPLIED ELECTRICITY

Here's a *brand new* set of electrical books to give you the "know how" on all branches of electricity from appliance repairing to D. C. and A.C. equipment, electrical refrigeration, etc. 3,000 subjects, 10,000 facts, latest methods all explained in easy to follow instructions. In order to prove how valuable and **Practical** this set of electrical books is **I'm willing to give you a FREE copy** of my book "150 Shop Prints and How to Read Them" **just for looking over this set.** Written by the Coyne Technical Staff and backed by 47 years' experience, this set has helped many ambitious electrical workers to **bigger pay, better jobs & added opportunity.**

OFFER LIMITED • ACT NOW! Here's my offer to you—if you act promptly. I'll send you the 7 volume set **Applied Practical Electricity** for 7 days **FREE** examination . . . together with the 150 Shop Print Book. Look the set over 7 days. If you like it send either $19.75 cash or send $3.00 after 7 days and $3.00 per month until $21 is paid. If you don't want the set, return it and YOU OWE NOTHING. **In either event, however, you keep the 150 Shop Print Book absolutely FREE.**

SEND NO MONEY! Coupon below is just a request to see the books free and to get my gift book for doing it. ACT—Send coupon Today!
Technical Book Div., COYNE ELECTRICAL SCHOOL, 500 S. Paulina Street, Dept. 87-R8, Chicago 12, Ill.

FREE BOOK Coupon



B. W. Cooke
Director

COYNE ELECTRICAL SCHOOL, Dept. 87-R8,
500 SOUTH PAULINA STREET, CHICAGO 12, ILLINOIS

O. K., send me, postpaid, Coyne's new 7 volume, "Applied Practical Electricity" for 7 days FREE TRIAL per your offer. Also send, absolutely FREE, the book of 150 Shop Prints as a gift.

NAME _____ AGE _____

ADDRESS _____

TOWN _____ ZONE _____ STATE _____

Embry-Riddle

TRAINING COUNTS MOST IN AVIATION

Get the right kind of training for a SUCCESSFUL AVIATION CAREER at Embry-Riddle's internationally known School of Aviation—in air-minded Miami. Intensive, practical courses—CAA approved. Authorized training under G. I. Bill.

You can become a flying mechanic or a certificated A & E mechanic. Or study radio; airplane operation and maintenance; design engineering; flight. Instruction covers whole field of aviation. Immediate enrollment.

It's always Summer in colorful Miami—the aerial crossroads of the Americas!

MAIL THIS COUPON—TODAY!

Dean of Enrollments—Dept. 51
Embry-Riddle School of Aviation
Miami 30, Florida

Send free information on Aviation Training to:

Name..... Age.....

Address.....

City..... State.....

Check One ☐ Veteran ☐ Non-Veteran

Be A MASTER PLUMBER

Earn $15 To $50 A Day

DON'T ENVY THE PLUMBER—BE ONE

Every skilled workman will tell you that Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job—compare his opportunities with any trade, plus the opportunities of having your own shop.
We teach you Plumbing with TOOLS (not books) under Licensed Master PLUMBERS in one of the finest equipped schools in America. We make you a Plumber, every branch is taught thoroughly—Lead Work—Blueprint for plan reading—all other tricks.

LEARN IN 30 WEEKS WITHOUT PREVIOUS EXPERIENCE

If you like to work with tools you owe it to yourself to investigate. No need to ever work as an apprentice. Get free bulletin. Write now! G.I. APPROVED. Our 24th year.

UNIVERSAL PLUMBING SCHOOL
819 HOLMES STREET KANSAS CITY, MO.

SURPLUS HARDWARE SPECIALS

High Speed Hacksaw Blades, Hand Type, Molybdenum, 10 in. 32 teeth $1.30 Doz.

3 Phillips Screwdrivers, #2, 3 & 4	set	$ .95
5 Common Screwdrivers, 1½"-2"-4"-6"-8"	set	1.25
6 Cold Chisels, Hand Type 4" to 8"	set	1.80
Carton of 10 GE 110 Volt 2½ Watt Argon Glow Lamp Standard socket listed at $.50 ea.	cart.	2.00
Tool Roll, Brown Duck, 26"x52"—49 Pockets	ea.	1.25
Hack Saw Frames, Adjustable, Mfgd. by Union Hdwe.	ea.	.60
12 Assorted Amer. Std. Files 6" to 14"	set	2.25
24 Assorted Files 4 to 14"	set	4.00
4 rasps 8 & 14" Cabinet, 14" Half Round, 12" Flat	set	2.10

All orders $5.00 and over sent postpaid.
All orders less than $5.00 add 10% for postage.
Write for complete list

INDUSTRIAL SUPPLY CO., 314 E. 33 St., N. Y. City 16, N. Y.

Big Money for Workers

In Home or Shop

Licensed Concrete Specialists wanted. No experience needed. Make *Colorglazed* concrete pottery without molds. New, low cost, patented method. Cemetery products, novelties, tiles, floors, etc. Basement leaksealing. Other big pay projects. Booklet, details free. Men only.

NATIONAL POTTERIES COMPANY
415 West Third Ave. Grand Rapids, Minnesota

Learn MECHANICAL DENTISTRY

To make Crowns, Plates, Bridgework, etc., for Dentists. Easy practical way to learn mechanical dentistry at home in spare time. FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE. Low tuition. Easy terms. Write for FREE BOOK about this money making profession that is not affected by the machine age.

McCARRIE SCHOOL OF MECHANICAL DENTISTRY
207 N. Broad St. Dept. 868 Philadelphia, Pa.

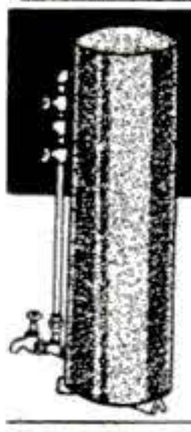
Learn RADIO TELEVISION ELECTRONICS

Our proven 2-Way Instruction trains you at home in spare time for a good pay job or a business of your own. For **FREE** book "Your Opportunities in Radio", write: **Hollywood Radio & Television Institute** (Established 1929), **Dept. D-10, 810 W. 6th St., Los Angeles, Calif.**

OLD GOLD JEWELRY WANTED

Dental gold teeth, plates and bridges with metal attached. Any broken pieces of gold jewelry. Immediate payment and free mailing container to you or your friends upon request.

LOWES, DEPT. PS Holland Bldg., St. Louis 1, Mo.



BUILD YOUR OWN ZEOLITE WATER SOFTENER

Troubled by water hardness? Build a LAR water softener for as little as $40.00. Requires only a wrench. Quickly pays for itself by savings in soap and clothing alone. Send $1.00 for complete plans and operating instructions. Money back if not satisfied.

LAKE REGION MFG. CO., BOX 2732-S, Minneapolis 7, Minn.

NOW

CHANITE SELF-WELDING FLUX—REPAIRS all ELECTRIC HEATING ELEMENTS. So simple anyone can make repairs in your broken or burnt-out electrical appliances—irons, toasters, stoves & etc. Guaranteed nothing like it. From our mines to your appliances. **$1.00** per package. **$7.50** per doz. Stick form **25c. $2.00** per doz.

CHANITE SALES COMPANY. 914 South Main, Fort Worth 4, Texas

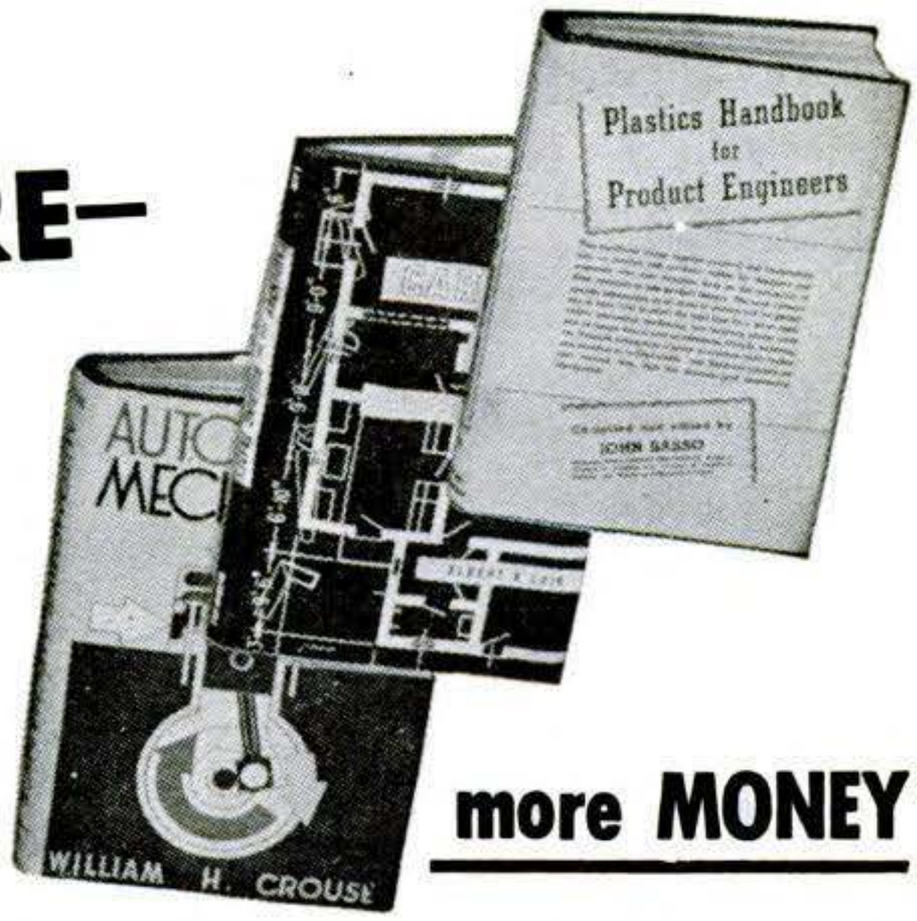
MICROSCOPES SUPPLIES-ACCESSORIES & SCIENTIFIC INSTRUMENTS

BEL SPENCER NEW & USED LEITZ ZEISS
BOUGHT·SOLD·EXCHANGED·REPAIRED
MEDICAL INDUSTRIAL AMATEUR
Send for **FREE** LIST
NATIONAL SCIENTIFIC INSTRUMENT CO. 119 CHAMBERS ST NY 7

Copyrighted material

HERE'S YOUR FUTURE—

These McGraw-Hill Books can mean a BETTER JOB... more MONEY



ELECTRONICS

1. Chute's ELECTRONICS IN INDUSTRY. Shows you in simplified diagrams and non-technical terms how electronics circuits and equipment are applied in all types of industry. Explains the theory of various types of electronic tubes and takes you step-by-step to a full understanding of the more complex circuits used for controlling motors, speeds, currents, temperatures, etc. Over 300 illustrations. 292 pages.....**$5.00**

AUTO REPAIR

2. Crouse's AUTOMOTIVE MECHANICS. A complete, practical guidebook for automobile maintenance. Tells you how your engine operates, explains ignition circuits, power transmission principles, and construction of your automobile. It shows you how to trace every squeak or cough to its source, keep your car operating at peak efficiency, and avert costly repairs. 617 pages.....**$4.50**

WOODCARVING

3. Tangerman's WHITTLING AND WOODCARVING. Clearly explains and illustrates all techniques. Goes from simple whittling through rustic, chain and fan carving, to caricatures, ship-in-bottle, chip carving and surface decoration. Takes you successfully from choice of a knife and the right piece of wood to the completed article. Hundreds of things to make—easy and intricate. 293 pages.....**$4.00**

CARPENTRY

4. Lair's CARPENTRY FOR THE BUILDING TRADES. Gives all the expert instruction you need on how to plan and do carpentry work for house building or remodeling—from planning and selecting materials to smoothing on the last trowel of plaster. Covers the latest FHA-approved methods for framing, roofing, floor-laying, finishing, etc. This is your key to better, quicker construction. 188 pages.....**$2.50**

SOLDERING

5. Taylor's SUCCESSFUL SOLDERING. Shows fully how to obtain the best results in all types of soldering—black iron, zinc, stainless steel, copper, aluminum, etc. Covers fundamentals of the process, materials and methods to save you hours of time, and help you turn out a stronger, better job. 76 pages. **$1.25**

MATHEMATICS

6. Palmer and Bibb's PRACTICAL MATHEMATICS FOR HOME STUDY. The essentials of arithmetic, geometry, algebra and trigonometry explained in easy-to-understand terms. Hundreds of practical problems show you how to apply mathematics to everyday situations. Covers fractions, percentages, ratio, equations, logarithms, trigonometric functions, etc. 697 pages...**$4.00**

MICROSCOPY

7. Corrington's WORKING WITH THE MICROSCOPE. The best methods for using the microscope and preparing slides for study. It tells how to fix, stain, section and mount all types of organic and inorganic material from the simplest mounts to the highly technical. 418 pages.....**$4.00**

PLASTICS

8. Sasso's PLASTICS HANDBOOK FOR PRODUCT ENGINEERS. Up-to-the-minute facts on plastics and synthetic rubbers. Tells you which material is best suited for the job—how to process, machine and finish plastic parts—what faults are common to certain plastics and how to remedy them. All the latest techniques and materials are included with a thorough discussion on recent developments in synthetic rubbers. 465 pages. $[illegible]

AIR CONDITIONING

9. Allen, Walker and James' HEATING AND AIR CONDITIONING. A comprehensive treatment of heating and air conditioning systems for residences, factories, office buildings, theatres, etc. Discusses fully the theory underlying heat conservation and air conditioning engineering and covers the numerous post-war developments in this rapidly expanding field. 330 illustrations, charts and tables. 667 pages.....**$5.50**

ELECTRICITY

10. Abbott's NATIONAL ELECTRICAL CODE HANDBOOK. Tells how to handle all kinds of wiring and installation jobs in strict accordance with the 1947 Code. Practical direction, simple language, and diagrams make clear the meaning of the rules and help you avoid costly errors. All rules pertaining to a job are grouped for easy reference, saving time and preventing oversight. 633 pages.....**$4.00**

SCIENCE

11. White's PRACTICAL PHYSICS. Here is a handbook of the laws of mechanics, heat, light, sound and electricity for the industrial and technical worker, with emphasis on practical application. 365 pages.....**$3.50**

HOUSE REPAIRS

12. Whitman's FIRST AID FOR THE AILING HOUSE. A big, moneysaving guide to all kinds of house repairs. Enables you to be your own repairman and to deal more economically and intelligently with mechanics. 349 pages.....**$2.75**

SEND NO MONEY—MAIL COUPON

McGRAW-HILL BOOK CO., 330 W. 42nd ST., NYC 18

Send me the books corresponding to the numbers circled below for 10 days' examination on approval. In 10 days I will remit for the books I select to keep, plus a few cents postage, and return those I do not want to you, postpaid. (Postage paid on cash orders.)

1 2 3 4 5 6 7 8 9 10 11 12

Name.....

Address.....

City and State.....

Position.....

Company..... PSM-11-47

(For Canadian prices, write McGraw-Hill Co. of Canada Ltd., 12 Richmond Street E., Toronto 1.)

SEE THESE BOOKS FREE!

Just send coupon for books you'd like to inspect. See for yourself how much they give for your money. No advance payment, no obligation. After 10 days' examination, return any unwanted books, and remit for those you decide to keep. Here's your key to a better future—Mail coupon today.

Copyrighted material

AUDELS Carpenters and Builders Guides

4 vols. $6

Inside Trade Information for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—including new methods, ideas, solutions, plans, systems and money saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, simply fill in and mail the FREE COUPON below.

Inside Trade Information On:

How to use the steel square—How to file and set saws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint

AUDEL, Publishers, 49 W. 23rd St., New York 10, N. Y.

Mail Audels Carpenters and Builders Guides, 4 vols., on 7 days free trial. If OK I will remit $1 in 7 days and $1 monthly until $6 is paid. Otherwise I will return them. No obligation unless I am satisfied.

Name_____

Address_____

Occupation_____

Employed by_____ PSM

HOW I STEPPED *into a* Big Pay HOTEL JOB!

Louie M. Mueller becomes Hotel Manager Although Without Previous Hotel Experience

"For years I worked at routine jobs, none of which offered me the promising future I was seeking. One day I answered a Lewis ad, read their book and decided to enroll. Now Manager of this prominent hotel, I'm happy in my work and, thanks to Lewis training, look forward to even more success."

HOTELS NEED TRAINED MEN AND WOMEN

Thousands of Lewis-trained men and women winning success and a sound, substantial future in the colorful hotel, club and institutional field. They are making good as Managers, Assistant Managers, Stewards, Hostesses, Executive Housekeepers and in 55 other types of well-paid positions. Not only has this fascinating business been breaking records, but authorities agree the greatest travel boom in history is now under way. The demand for trained men and women, therefore, will be greater than ever.

Previous experience proved unnecessary in this business where you are not dropped because you are over 40. Good grade school education, plus Lewis Training qualifies you at home, in spare time. Write your name and address in the margin and mail this ad TODAY for Free Book which tells how you are registered free of extra cost in Lewis National Placement Service

Course approved for Veterans' Training

☐ Check here if you are a veteran.

Lewis Hotel Training School 32nd SUCCESSFUL YEAR

Room LW-2785 Washington 7, D. C.

"YOU ARE UNDER ARREST!"

There's a Thrill in Bringing a Crook to Justice Through Scientific

CRIME DETECTION!

We have taught thousands this exciting, profitable, pleasant profession. Let us teach you, too, **in your own home.** Learn Finger Printing, Fire Arms Identification, Police Photography and Criminal Investigation thoroughly, quickly and at small cost.

Be A FINGER PRINT Expert

Over 800 of All American Bureaus

of Identification employ students or graduates of I. A. S. You, too, can fit yourself to fill a responsible crime detection job with good pay and steady employment. But don't delay—get the details now. Let us show you how easily and completely we can prepare you for this fascinating work, during spare time, in your own home. You may pay as you learn. Write today . . . Now . . . Be sure to state age.

FREE!!! Send for Thrilling "BLUE BOOK OF CRIME"

INSTITUTE OF APPLIED SCIENCE
1920 Sunnyside Ave., Dept. 1368, Chicago 40, Ill.

AMAZING DISCOVERY! Guides hand—Corrects your penmanship in few hours.

Improves Handwriting In 3 Hours

Write, OZMENT, 35-C, St. Louis, Mo.

LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c, Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. **All 62 Full Size Patterns, $1.00 Postpaid. Strother Pattern Service, Dept. 7-X, Box 383, Belington, W. Va.**

START FURNACE FIRES WITHOUT—PAPER WOOD—CHARCOAL

STOP THAT endless hunting for kindling wood—eliminate muss, bother, soiled hands and clothes, cold damp houses, the dangers from chopping wood. As simple as lighting a match, the Rocket Furnace Lighter roars into action—builds a hot, blazing coal fire in 3 minutes. **Costs less than a bundle of kindling.** Gives trouble free, lifetime service—makes coal furnaces as convenient as expensive automatic heating units. Write for FREE descriptive literature and order yours NOW!

LORAIN FURNACE LIGHTER CO. 1794 E. 33rd St. LORAIN, OHIO

BECOME A PISTOL EXPERT WITH A **HY-SCORE AIR PISTOL**

- No Pumping
- Powerful, Fast
- Single Shot
- Precision-Made
- 30½ oz.; 10¼" long

HY-SCORE PELLETS FIT ALL PISTOLS Cal. 177 2.50 Cal. 22 3.00 per 1000

SEE YOUR DEALER Send for Free Circular Dept. S-11

HY-SCORE ARMS CORP. : BROOKLYN 1, N. Y.

BATTERIES!—START

—a factory at home and re-cast junk batteries into new; latest achievement. We supply complete instructions and everything needed. Big Profits!

BATTERY LABORATORIES, Dept. PS, Minneapolis 4, Minn.

TALK-SING *thru your own radio with* RADIO MICROPHONE

Be the life of the party. Put on your own broadcasts at home. Talk-Sing, make announcements from any room. Wonderful voice practice. Microphone easily attached to any radio. Follow enclosed instructions. SEND NO MONEY—pay Postman $1.98 plus postage. Send Money Order or check and save postage.

EMPIRE RADIO & TELEVISION CO. (Dept. R1) 1521 Bedford Ave., Brooklyn 16, N. Y.

OTTAWA TRACTOR SAW

350 Cuts Per Minute--cuts them down, saws them up, one man operates. Thousands in use, stiff heavy blade, built to last, safety clutch control, uses power take-off any tractor. Low price.

OTTAWA MFG. CO., 2-701 Forest Avenue, OTTAWA, KANSAS

Copyrighted material

Now YOU CAN HAVE IMPROVED No-DRIFT FM *in the Sensational New 1948*

MIDWEST RADIOS

NEW SERIES 16* SUPER DE LUXE AM-FM CHASSIS

14½" PANASONIC SPEAKER

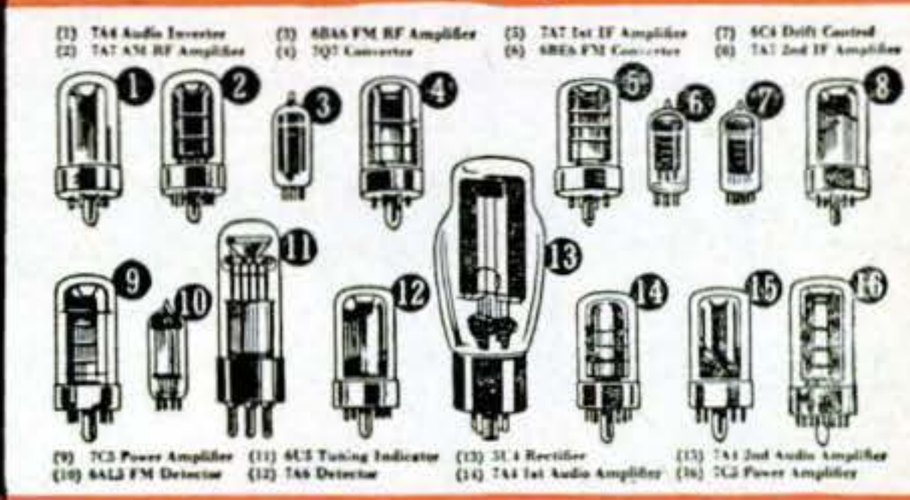
5 WAVE BANDS

Here is the finest radio Midwest has ever produced in its 28 years of manufacturing—a world-ranging, 5-band radio with improved Midwest No-Drift FM . . . plus Standard Broadcast and 3 short wave bands, Television Audio Switch-over, and Color-Ray Tone Selection. The Series 16* Super De Luxe Chassis is a powerful, magnificently-toned radio that challenges comparison for performance, sensitivity, selectivity, and advanced engineering features. Supplied with satin stripe copper finish panel—ready to mount in your present cabinet. Send today for the FREE 1948 Midwest Radio Catalog. Buy your radio direct from the manufacturer on Easy Terms and 30 Days Trial and SAVE!

*SERIES 16 CHASSIS USES ALL THESE LATEST-TYPE TUBES, RECTIFIER AND TUNING INDICATOR

30 DAYS TRIAL — **LOW FACTORY-TO-YOU PRICES** — **EASY TERMS**

A COMPLETE LINE OF FINE RADIOS AND RADIO-PHONOGRAPHS . . . *Available in Separate Chassis Like the Powerful Series 16* AM-FM Model above, or in beautiful Radio-Phonograph Consoles like this:*



Scores of NEW Features such as the Exclusive MIDWEST TRI-MAGNADYNE COIL SYSTEM and COLOR-RAY TONE SELECTION

SYMPHONY GRAND AM-FM RADIO-PHONOGRAPH CONSOLE *with NEW Intermix AUTOMATIC RECORD CHANGER*

Our Finest! A superbly beautiful musical instrument . . . a masterpiece of furniture design and radio engineering that offers the sensational Midwest NO-DRIFT FM, Automatic Intermix Record-Changer, Exclusive Color-Ray Tone Selection, World-ranging 5-Band Reception, Television Audio Switch-Over, and many more new and exclusive features.

Rush for Free Catalog!

FILL IN COUPON AND MAIL TODAY OR JUST SEND YOUR NAME AND ADDRESS ON 1c POSTCARD

MIDWEST RADIO CORP.
Dept. 24-M, 909 Broadway
Cincinnati 2, Ohio

Gentlemen: Please send me your new FREE catalog and details of your liberal 30 Days Trial.

Name.....

Address..... *Zone*..... *State*.....

City.....

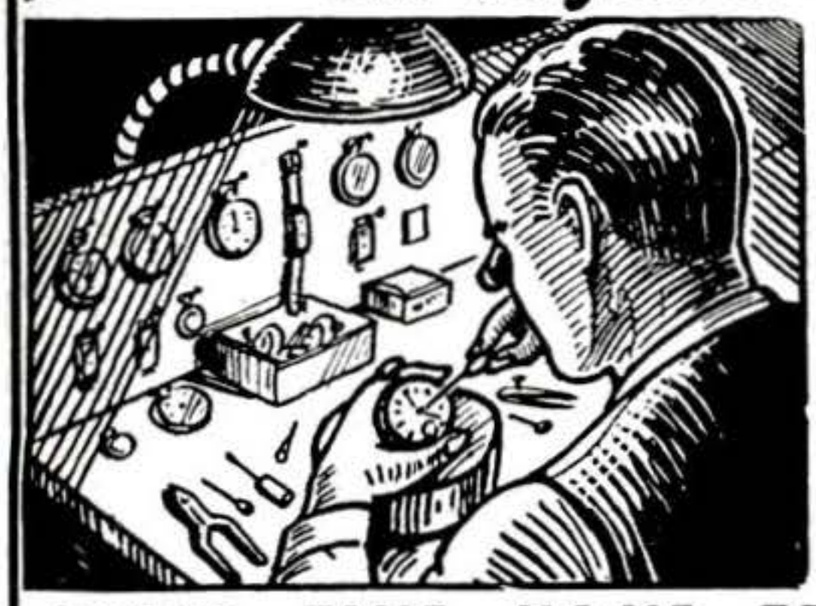
MIDWEST RADIO CORP.
Dept. 24-M • 909 BROADWAY • CINCINNATI 2, OHIO

Copyrighted material

Learn

WATCH REPAIRING

from
An Approved School
The Largest of Its Kind



EARN WHILE LEARNING

SPARE TIME HOME TRAINING PREPARES YOU FOR BIG PAY

FREE WATCH working tools and watch included as part of our Watch Repairing Course

The demand for skilled watch repairers—men and women—is increasing with the step-up in the manufacture of watches. Now is the time to prepare yourself in this fascinating profession with the aid of our highly practical HOME TRAINING COURSE—in your spare time at home. Start your own business or accept a big pay position.

WRITE TODAY FOR FREE DETAILS—Earn while you learn with an "approved" school. Get the facts—then judge.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870 Elston Ave., Dept. PS-11 Chicago 18, Illinois

ELECTRICAL BOOKS *shipped for* EXAMINATION

8 BIG BOOKS

SEND NO MONEY

MODERN ELECTRICITY
INCLUDING RADIO AND REFRIGERATION

Here's great news for anyone interested in Electricity. NEW, up-to-date 19th Edition of Applied Electricity with new subjects fully covered, including blueprint reading, electronics, F. M. radio, fluorescent lighting. 8 Big Books sent for examination!

NEW Edition for Beginners and Experts
Over 3700 pages. 2700 illustrations and 134 tables in most complete electrical work we have published. Dynamos, motors, diesel plants, power stations, transmission—everything explained for easy understanding.

BIG FIELD! Big Demand! Big Pay!

Men who understand electricity are needed **now** in all kinds of industries. Practically every business depends on electrical knowledge, and men who know this subject make big money. Learn easily with these **new**, interesting books. Send coupon for a set of books on approval. See how they will help you to get ahead faster.

SEND NOW [A year's consulting privileges with our engineers now given to all buyers of this famous Cyclopedia of Electricity.]

AMERICAN TECHNICAL SOCIETY
Vocational Publishers Since 1898

American Technical Society, Dept. E820, Drexel at 58th St., Chicago 37

Send for 10 days' free use, 8 volume set of New 19th Edition, Applied Electricity, including a certificate entitling me to consulting privileges for one year. I will pay the delivery charges only on the books. If I wish I may return them in 10 days and owe you nothing, but if I keep them, I will send $2.00 after 10 days, then $3.00 a month until the total price of only $34.80 is paid.

NAME.....

ADDRESS.....

CITY..... STATE.....

Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

LEARN AT HOME TO MOUNT BIRDS

Animals, Heads, Fishes, Pets; to TAN.
Be a Taxidermist. Profit and FUN.

Hunters, save your valuable **TROPHIES.** Mount ducks, squirrels, everything. Learn to **TAN** for leather and furs. Wonderful **HOBBY** Have a **HOME MUSEUM.—BIG PROFITS** mounting for others. **INVESTIGATE NOW.**

FREE BOOK With 100 fine game pictures. **NOW** absolutely **FREE. Write TODAY.**

Send Postal TODAY for FREE BOOK. State AGE.
N. W. SCHOOL OF TAXIDERMY, Dept. 9398, Omaha, Neb.

NOW YOU CAN GET ALL THE FAMOUS

CORRESPONDENCE COURSES

And Educational Books BELOW COST

SEND FOR FREE CATALOG
We Buy and Sell

Study at home. Realize your ambition for a big paying future in Trades, Professions, Industries, Arts & Sciences, etc., quickly and easily. NO TESTS required. **New and used.**

COLLEGIATE BOOK CORPORATION
233 W. 42 St., Dept. PS-11, New York 18, N. Y.

HOW TO CUT RAFTERS

New vest pocket book gives lengths, Side cuts, Plumb cuts, Deductions. For all rafters for any building from one inch to forty feet wide. Gives numbers to cut on square. Also degrees for same cuts for Radial Saws. All standard pitches from 1/8 to 5/8. Just open book to pitch page and there are your lengths, side cuts, etc. Anyone who knows what a jack rafter is can frame a roof if he has this great book. Price one dollar prepaid. **Builders' Topics, Dept. S, Lock Box 828, Seattle, Washington.** Original teachers of the square in five easy lessons by mail. SEND FOR FREE LIST OF TECHNICAL BOOKS. Learn to read blueprints, etc.

CODE SPEED SHORT CUT

Be an expert. Learn to be a Telegraph or Radio Operator. Thousands of men needed. Intensely interesting work—good pay. Learn at home or wherever you are, quickly, easily with the famous Candler Speed System. Book of particulars Free.
CANDLER SYSTEM CO. Dept. 6-M, Box 928, Denver 1, Colo. U.S.A.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. G.I. Approved. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 83-S, 646 N. Michigan Ave., Chicago 11, Ill.

BUILD ARC WELDER PLANS 35¢

We Show You How to build this new powerful welder without rewinding. For light or heavy work. Uses coils taken from old auto generators. Works on 110 or 220 volts A. C. Has 20 different heats. Send 35c for complete PLANS and valuable Catalog. Write today.
LEJAY MFG. CO., 3323 LeJay Bldg., Minneapolis 8, Minn.

COMB-A-TRIM

The New Quick Trimmer

Something New! Trim your hair without any experience. It's easy! The excess hair comes off smoothly and easily by just pulling trimmer through hair like an ordinary comb. Save on hair-cut bills. . . . Trim your own hair or the whole family's. Send 59c and your Comb-A-Trim will be sent at once, postpaid.

59c

SPECIAL OFFER Send $1.00 for 2 Comb-A-Trims. Save 18c **2 for $1** 5 Extra Blades (Year's Supply) **25c**

COMB-A-TRIM CO., CAREW TOWER, Dept. J-23, Cincinnati, Ohio

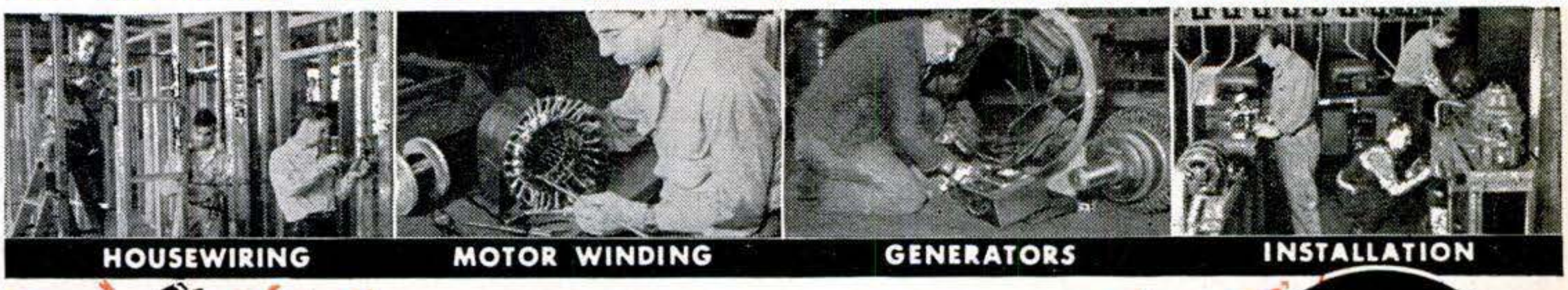
A PENNY POSTCARD MAY CHANGE YOUR FUTURE...

Get full information on the coin-operated vending machine industry. Start with a few machines and build a wonderful future. We'll give you complete advantage of our "know-how." Send for Free Booklet Today—**No Routes Sold!**

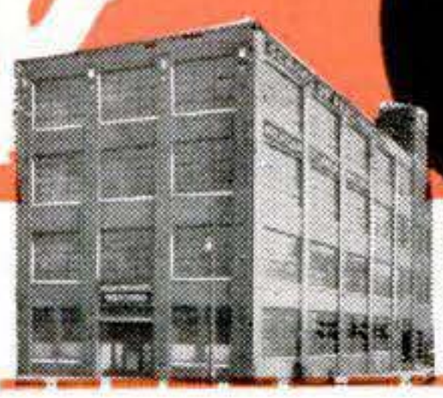
PIONEER VENDING SERVICE
ADDRESS ALL MAIL TO DEPT. PS
461 SACKMAN ST. • BROOKLYN 12, N. Y.

Copyrighted material

DO ACTUAL ELECTRICAL WORK DAILY IN OUR LARGE SHOPS



GET INTO BIG-PAY ELECTRICITY



NATION'S LARGEST EXCLUSIVE ELECTRICAL SCHOOL

MAIL TODAY FOR QUICK ACTION

QUICK, THOROUGH, EASY-TO-LEARN-TRADE

Steady job, good pay, clean work! . . . That's your future in this lifetime trade. Learn-by-doing in a few months on actual equipment . . . not "home study"—not "mail"—not "spare time"—YOU GET PRACTICAL "A TO Z" EXPERIENCE in our modern resident shops. Get ready fast for many electrical jobs now open everywhere! New classes start every few weeks. Living quarters arranged.

NO COST TO VETERANS *Train at Gov't. expense. Receive $65 to $90 month while learning. Coupon brings details.*

MICHIGAN TECHNICAL INSTITUTE
Department PS-11, 2281 West Fort Street, Detroit 16, Michigan

MICHIGAN TECHNICAL INSTITUTE, Dept. PS-11
2281 W. Fort St., Detroit 16, Michigan

MAKE MORE $$$

☐ Send me catalog and complete information.
☐ I am a GI. Send special information.
☐ Married. ☐ Single.

NAME _____
ADDRESS _____
CITY _____ ZONE ____ STATE ____

WHICH OF THESE *Opportunities* INTERESTS *You* MOST?

● *Today,* choose the job you want—and prepare for it. Or if you are already engaged in the work you like best, start training *now* for quicker promotion. Acquire the knowledge that will help you to get ahead faster, make more money and have greater security.

American School, founded in 1897 as an educational institution *not for profit,* can help you to reach your goal just as it has helped others during the past fifty years. Check the coupon at right, add your name and address and mail it at once. The school will send you details on its training plan and outline of study prepared by specialists. There is no charge, no obligation, so send the coupon immediately.

AMERICAN SCHOOL
Dept. G846, Drexel at 58th Street, Chicago 37

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. G846, Drexel at 58th, Chicago 37, Ill.
Without obligation, Please send FREE and postpaid, bulletin and details of the Subjects checked:

☐ PLASTICS ENG'R
☐ Refrigeration
☐ Architecture and Building
☐ Contracting
☐ Practical Plumbing
☐ Automotive Engr.
☐ Aviation Drafting
☐ Aviation
☐ Business Management
☐ Accounting
☐ Electrical Engr.
☐ Electricity-Pract.
☐ Electronics, Industrial
☐ Bookkeeping
☐ Private Secretary
☐ Diesel Engineering
☐ Sheet Metal Pattern Drafting
☐ Railway Training
☐ Drafting and Design for Men and Women
☐ Radio
☐ High School
☐ Air Conditioning
☐ Mechanical Eng.
☐ Shop Management
☐ Tool Making
☐ Better Foremanship
☐ Machine Shop Operations

Name ..... *Occupation* .....
Address ..... *Age* .....
City ..... *State* .....

Copyrighted material

AVIATION *Career*

MAXIMUM TRAINING IN MINIMUM TIME

CAL-AERO TECH TRAINING will add dollars to your pay check all the rest of your life. Specializing in AERONAUTICAL ENGINEERING and MASTER AVIATION MECHANICS since 1929, Cal-Aero Tech training is carefully designed for just one thing—TO MAKE MORE MONEY FOR-YOU. An alumni of over 6000 successful graduates proves our career training is unsurpassed.

VETERANS —Write us about Aviation Training, as provided under "G.I. Bill of Rights."

CAL-AERO TECHNICAL INSTITUTE
MAJOR C. C. MOSELEY — PRES. SINCE 1929
FORMERLY CURTISS-WRIGHT TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL
GLENDALE 1, CALIFORNIA
LOS ANGELES COUNTY

MAIL THIS COUPON TODAY!

Cal-Aero Technical Institute, Grand Central Airport, Glendale 1, California
Please send full information on Aviation Training FREE—without obligation. Dept PS-11

Name_____ Birth Date_____
Street_____
City_____ State_____

START NOW TOWARD A FUTURE IN

REFRIGERATION *and* AIR CONDITIONING

Refrigeration and Air Conditioning are among the giant Industries of America. Such industries need men who KNOW. Many men servicing and installing equipment are making large incomes.

Spare Time Training

If mechanically inclined, get the training you need to qualify for experience installing & servicing Refrigeration and Air Conditioning in stores, offices, homes.

Then you should have no difficulty getting started in these great industries. As experience, tools and a personal following are acquired; you may find it practical, later, to start your own REFRIGERATION and AIR CONDITIONING SHOP.

Approved for training under G.I. Bill

Practical Interesting Training

You'll like our way of training—through capable home-study instruction followed by practice on actual equipment under watchful eyes of seasoned Refrigeration and Air Conditioning men in our shops. You'll get top-rate instructions—the easy way. So **get the facts now—FREE** of obligation. Write TODAY—SURE!

UTILITIES ENGINEERING INSTITUTE, Dept. 3117.
2525 Sheffield Ave., Chicago 14, Ill.
Please send me the Free FACTS about opportunities in Air Conditioning and Mechanical Refrigeration. I marked the one that interests me most.

REFRIGERATION TRAINING SINCE 1927

☐ **Air Conditioning** ☐ **Mechanical Refrigeration**

NAME_____ Age_____
ADDRESS_____
CITY_____ Zone_____ STATE_____

Do You Make These Mistakes in English?

MANY persons say "between you and I" instead of "between you and me"—or use "who" for "whom"—or don't know whether to spell certain words with one or two "c's" or "m's" or "r's," or with "ie," or "ei," etc. Every time you speak or write you show what you are. Mistakes in English reveal lack of education, refinement. Lack of language power prevents you from presenting your thoughts in the strongest way. Real command of English will help you reach ANY goal. Stop making mistakes in spelling, punctuation, pronunciation, grammar. Increase your vocabulary.

Sherwin Cody

WONDERFUL INVENTION

Only 15 minutes a day with Sherwin Cody's new invention—and you can actually SEE your English improve. It teaches by HABIT—makes it easier to do the RIGHT way. Wonderful self-correcting lessons.

FREE BOOK ON ENGLISH Lack of language power may be costing you friendships, income, every year. See what Mr. Cody can do for you; it costs nothing to find out. Write this very minute for free book, "How You Can Master Good English in 15 Minutes a Day." It will prove a revelation. WRITE NOW. **SHERWIN Cody School of English, 1811 B & O Bldg., Rochester 4, N. Y.**

Up to $600 Weekly

with new
5 MIN. PHOTO EQUIPMENT
No experience necessary

Booth models—for your own small store location, arcades, department, variety, other stores, lobbies, depots, carnivals, parks, beaches, etc. **Portable models** for street corners, parks, picnics—anywhere.
Send 3c stamp for BIG PROFITS Plan.

FEDERAL IDENTIFICATION CO.
Dept. B4, 1012 N.W. 17th, Oklahoma City, Oklahoma

MASTER CHAMPION

LAWN MOWER SHARPENER
Also Mfg., Saw Sharpening & Key Machines

FRANK'S MFG. CO.
Dept. PS-11, 3312 Tweedy Bl.
SOUTHGATE, CALIF., U.S.A.

WIN *with* MAGIC CARDS

This special deck of playing cards with secret code on back of each card tells YOU what each card is when lying face down. Easy directions explain code and how to do many kinds of "Magic" tricks. Use same deck for usual card games, such as poker, bridge, etc. Only $1.49. Get a deck today. SEND NO MONEY. Send Name and Address. Pay postman on arrival only $1.49 plus postage. Money back if not delighted. Address

Hollister-White Co., Dept. 455-D
215 N. Michigan Ave. Chicago 1, Illinois

Test Your Wits! ERNO PUZZO GAMES

Baffling - Challenging - Provoking

Aggravating puzzlers that help improve your mind and provide a worthwhile pastime. Exciting fun! Beautiful 6-color panels. IDEAL GIFTS. Send $1 for 5, all different. Solutions included. $1.25 outside USA.

ERNO SALES CO., Box 1146-P, Cleveland 3, Ohio

If Ruptured

Do What Others Now Do—

Wear a Form Fitting MILLER Truss

which provides natural freedom and comfort in working, walking, playing, horse back riding, dancing, swimming or sleeping. You just cannot afford to be without this protection and convenience.

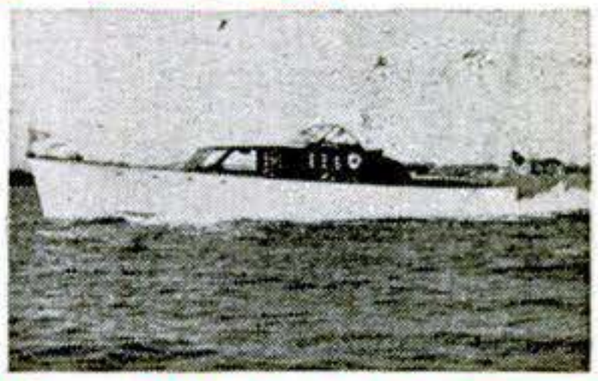
Wear two weeks then consult your physician before deciding to keep it.

Write me today for **FREE** descriptive circular. Sent in plain, sealed envelope.

FRED B. MILLER Manufacturer
Dept. P.S. Hagerstown, Maryland.

Copyrighted material

LEARN DIESEL THE QUICK, EASY WAY



THE FAMOUS HEMPHILL WAY!

Wherever Diesels are used, the name "HEMPHILL" is famous It stands for TRAINED MEN—men who *know* Diesel Many trained Diesel graduates of Hemphill Schools are successfully engaged in work where their Diesel training is "paying off." Perhaps they are assembling Caterpillar Tractors, or servicing Cummins-powered trucks, or installing and maintaining General Motors Diesels. Perhaps they are working with these and other makes of Diesel engines in trains, ships, drilling rigs, sawmills or construction equipment—but no matter what the Diesel job, Hemphill trained men have the "know how" to handle it.

Prepare YOURSELF for the great industrial swing to Diesel power which is now here Get complete details of Hemphill Diesel training now!

STUDY AT HOME—Learn Diesel AT HOME in your spare time, without interfering with your present activities Prepare for a bigger future this quick, easy way Mail the coupon below for complete details and free literature. **Or attend 34 weeks resident classes at schools listed below.**

Home Training approved for Veterans under G.I. Bill

VETERANS and NON-VETERANS—Ask about our Home Study and Resident courses available in New York, Memphis and Los Angeles.

RESIDENT SCHOOLS LOCATED AT:

NEW YORK	LOS ANGELES	MEMPHIS
31-28 Queens Blvd.	1601 S. Western Ave.	311 S. Main St.
Long Island 1, N Y	Los Angeles 6, Calif	Memphis 3, Tenn

34 weeks practical training. If you would prefer to train at one of these three schools, indicate by check on coupon.

MAIL COUPON NOW!

HEMPHILL DIESEL AND AUTOMOTIVE SCHOOLS
Administrative Office: 1601 South Western Ave., Dept. PS 11-7
Los Angeles 6, California
Gentlemen Please send me FREE BOOKLET and information on your Diesel Courses.
I am interested in Home Study ☐ Resident School ☐ at New York ☐ Memphis ☐ Los Angeles ☐ (Check school desired.)

Name_____ Age_____
Street_____ Zone_____
City_____ State_____
Veteran_____ Non-Veteran_____

Shop Training in a Nationally Known School

For Men Who Want BETTER JOBS IN ELECTRICITY or RADIO

ELECTRICITY including Electronics
Men with right training have big pay opportunities in electricity and industrial electronics. Great developments going on—rural electrification, vast increase in manufacturing plants, tremendous building program. Get training that makes you confident to handle bigger jobs. Train in modern C.T.I. shops on actual equipment.

RADIO—Big years right ahead. Vastly increased number of radio receivers, widespread development of FM broadcasting, installation of public address systems. Men who do work quickly, efficiently hold good jobs or own a growing business. C.T.I. Radio course is NOT an engineering course. It is a program designed to prepare a man for the many opportunities available to Radio Technicians and Servicemen. Find out NOW about C.T.I. training. Learn for yourself why it offers so many important advantages. Rapid progress possible by Learn-By-Doing SUPERVISED SHOP TRAINING.

FREE BOOK

Mail Coupon Get Facts

Commercial Trades Institute located in one of finest residential districts in Chicago. Only block from Lake Michigan with summer and winter sports. C.T.I. executives won recognition training service men in specialized fields. Same high quality training has made C.T.I. nationally known school. CONSULTATION AND PLACEMENT SERVICE WHETHER YOU ARE INTERESTED IN WORTHWHILE JOB OR SETTING UP YOUR OWN BUSINESS. May never again be such opportunities to get in on ground floor and go up fast.

FREE—four color book—see actual photos of C.T.I. shops—get facts about benefits of C.T.I. services and training—learn about developments in Electricity, Industrial Electronics, Radio. Send for yours today, no obligation, mail coupon NOW!

VETERANS qualifying under "G.I. Bill" have all expenses paid by Government plus monthly subsistence allowance. Just mail coupon, we will handle all details. (LOW TUITION, EASY TERMS if you are not a veteran.)

COMMERCIAL TRADES INSTITUTE
Dept. C111, 6312 N. Broadway, Chicago 40, Ill.
FREE—Important Information Telling How to Get Started

Here's the Way to Get Ready in a Few Short Weeks

Fill Out, Cut Out, Mail Today

FACTS FREE for Men Who Want to Get Ahead
COMMERCIAL TRADES INSTITUTE, Dept. C-111
6312 N. Broadway, Chicago 40, Ill.
Send me free illustrated Booklet and other information about the field I have checked below.
( ) Electricity ( ) Radio

Name.....
Address.....
City.....State.....
( ) Veteran ( ) Non veteran

Copyrighted material

WANT A KEY JOB OR A BUSINESS OF YOUR OWN?

BIG OPPORTUNITY

THIS COUPON MAY BE YOUR

REFRIGERATION—AIR CONDITIONING

Take a good look at the man you envy. What has he got that you haven't got? The chances are his success is simply a matter of training. He knows his job. He is a specialist in his field.

Why, then, should you be content with a small job at small pay. The door to opportunity is open today—wider than ever before. Now is the time to do something about your future.

Take a friendly tip. Investigate the field of Refrigeration & Air Conditioning. Here is an industry that offers every opportunity you could ask . . . good jobs, security—plenty of chance for advancement—a business of your own.

The Industrial Training Institute, **largest and most completely equipped school of its kind in the world,** will give you the practical training you need. You can start at home without giving up your present job and when you have completed your theoretical training, we will bring you to Chicago where you will learn the practical **"know-how"** by working on actual equipment in our big, expertly staffed shops.

No advanced schooling is needed. Our unique proved methods make everything easy to grasp. We've trained thousands. Pay as you go. Quit when you want to. But in any case our first responsibility is to prepare you for a better job and a happier future. And after you have graduated you enjoy all the advantages of our life-time employment service—wherever you go, whenever you need it.

FACTS ABOUT THE INSTITUTE

Founded in 1916. Has trained more than 400,000 men for practical work in industrial fields. From 1942 through 1945 trained specialized technicians, exclusively, for the Army, Navy and Marine Corps. Now training thousands of veterans under the G.I. Bill, both in its Residence Schools and by home-study. Occupies five buildings of its own. Has over $500,000 invested in training facilities, with an instruction staff of more than 100 men. Known everywhere as America's foremost school of practical training for industry.

ACT NOW

Don't delay. Time is passing fast. Mark and mail the coupon below. It will bring you, without obligation, full details of this and other courses, from which you may choose. Take the step that may be the turning point in your career to a better job and bigger earnings.

SEND FOR THIS BOOK —IT'S FREE

Industrial Training Institute,
2150 Lawrence Ave., Dept P2LR Chicago 25, Ill.

I am interested in getting ahead. Send me FREE copy of your "Camera Visit" book. I would like to train for_____(name field).

Name_____

Address_____

City_____

Are you a Veteran_____

GET THE FACTS ABOUT AMERICA'S FOREMOST SCHOOL OF PRACTICAL TRAINING

MAKE BIG MONEY IN LIQUID SYNTHETIC MARBLE

FEW DOLLARS STARTS YOUR OWN PROFITABLE BUSINESS!

Here are 3 amazing, new opportunities to get into your own highly-profitable, dignified business—without previous experience—regardless of your age or sex. **1. LIQUID Synthetic MARBLE**—Easy to make and install beautiful synthetic Marble Slabs—pouring from liquid state. Big Demand for kitchen and bathroom walls, etc. **2. FIBRE-TITE FLOORING**—Easy to make and install—in any color or color combination. Many years wear. Dustproof. Soundproof. Verminproof. **3. FLEXIBLE MOLDS**—for Plaster Casting. $1.00 in raw materials makes up to $25 worth finished products. F. B., Iowa, writes: "Am on job that will net me $150 for 4 days work." Get FREE details. No obligation. Write today!

Write for FREE DETAILS NOW!

COMPOSITION PRODUCTS CO.

5853 Delmar Blvd. Dept. 112 St. Louis 12, Mo.

WALKIE SIREN

Formerly $15.00 - Now Only $3.95

GOV'T SURPLUS. A precision instrument. Easy turn of crank produces CLEAR, FULL SIREN TONE. Can be heard for great distance. Ideal for Boats, Autos, Schools, Sporting Events, etc. Dimensions 7" x 8" x 5". Wt. 4½ lbs. Price includes shoulder strap and waterproof cover. **SEND NO MONEY.** Just name and address. We'll ship C.O.D. for **$3.95** plus postage, or send money in advance, we'll ship prepaid. Canadian price **$4.50. ILLINOIS MERCHANDISE MART, Dept. 401-B, 1227 Loyola Ave., Chicago 26, Ill.**

RADIO

ENGINEERING Television, FM, Broadcasting, Servicing, Electronics, Aviation, Marine & Police Radio taught thoroughly. 72 weeks' Engineering course equivalent to 3 years' college radio work. Approved Veteran Training. Catalog upon request.

Valparaiso Technical Institute. Dept. 503, Valparaiso, Ind.

ANALYZE HANDWRITING

Illustrated Lesson and Grapho Analyst FREE

shows you how to make money at home, full or spare time. Opportunities everywhere. **FREE Analysis Offer** for immediate answer. Must be over 21.

A.I.G.A. Inc., Wilhoit Bldg., Dept. 126-M, Springfield, Mo.

Are You Getting Our Flyers???

If not, PRINT your name and address on a penny postcard. It will mean dollars in the bank for you!!! Ask for our latest catalog and flyer. Dept. PS.

RADIO EQUIPMENT CO.

377 E. Main St. Lexington, Kentucky

"Your friendly parts house"

PLASTIC HOMES

New Building Material! Resurface old homes; build new ones. Colorful, beautiful! **LIQUID MARBLE**—Color-glazed! Molded, brushed, sprayed. **SANITARY COMPOSITION FLOORING**—Dustless, noiseless; put on like plaster; resilient—yielding as cork; lasts like stone; plain or marked in tile design. **RUBBERLASTIC Mold Compound**—Mold novelties, statuary, toys, gifts, plaques, plaster animals. **COLORED POTTERY**—Birdbaths, garden furniture, vases. **TILEX** colored roofing. Illustrated literature FREE.

RAPID MARBLEIZING SERVICE, Dept. 12-B, Edwardsville, Ill.

OPTICAL ILLUSION

makes any view or object you wish to draw seem to appear on the drawing paper in rich detail. Low-cost invention makes drawing simple tracing. Educates and amuses children and adults. Practical for artists. Free details. **Dept. PS-11, Bruce Enterprises, Box 235, North Hollywood, Calif.**

A TIP FOR THE HOME WORKSHOP

Keep micrometers factory-new, tools keen-cutting, motors and pulleys supple, with

FIENDOIL

FOR HOME • SHOP • SPORTS

3 oz. spout can 40c

Copyrighted material

SPECIALIZE
In 6 Months to 3 Years
COURSES

SERVICE
6 to 12 Months
- Electricity
- Welding
- Refrigeration
- Heating

TECHNICIAN
1 to 2 Years
- Electricity
- Radio
- Electronics
- Refrigeration, Heating, and Air Conditioning

PROFESSIONAL
3 Years
- Electrical Engineering Bachelor of Science Degree
  Major in Machinery or Electronics

PRACTICAL TECHNICAL TRAINING

Train for a substantial career in industry . . . or a business of your own. Our time-tested Concentric System enables you to build your career step by step. Each 6-month course is complete in itself, yet prepares you for advanced courses. Stay as long as circumstances permit—until you reach the top step in your technical training. More than 1,292 students now enrolled from 48 states and 8 overseas countries. Faculty of 92 specialists. World-wide alumni counselor committee. Terms start January, April, July. SEND COUPON TODAY!

MILWAUKEE SCHOOL OF ENGINEERING
A Technical Institute

Milwaukee School of Engineering, Dept. PS-1147
N. Broadway and E. State, Milwaukee, Wis.
Without obligation, send me free booklet "Career Building" and more details on course in .....
Name ..... Age .....
Address .....
City ..... State .....

INVENTORS

Highest
ROYALTIES and CASH
FOR INVENTIONS
When We Market Them

INVENTION MARKETING SERVICE "NPA ALLIED" BY ANY OTHER AGENCY IN THE WORLD
Write for FREE booklet without obligation

UNIVERSAL MARKETING CO., 126 Lexington Ave. (Suite C-11), New York 16, N. Y.

DRAW for MONEY . . . Be an ARTIST !

Trained Artists are Capable of Earning
$50, $60, $75 a WEEK!

You can learn to draw at home in your spare time the well-known WSA way. COMMERCIAL ART, DESIGNING, CARTOONING all in ONE complete course. No previous Art experience necessary—we teach you step-by-step. Prepare for a fascinating hobby or profitable career. For 33 years WSA graduates have been making good—WHY NOT YOU?

VETERANS! WSA Approved for Training Under G. I. Bill. Write for FREE BOOK, "Art for Pleasure & Profit", fully describes course and commercial opportunities for you. TWO ART OUTFITS included with training.

WASHINGTON SCHOOL OF ART, Studio 1311H
1115—15th St., N.W., Washington 5, D. C.
Please send me full information and your Free Book, "Art for Pleasure and Profit."
Name ..... AGE .....
Street .....
City ..... Zone .... State .....
☐ **I am entitled to training under the G. I. Bill.**

Copyrighted material

FALSE TEETH FIT TIGHT FOR LIFE OF PLATE

With One Application or YOUR MONEY BACK

Professionally Developed AMAZING

LINO-DENT

Patented

REAL COMFORT INSTANTLY FOR ALL PLATE WEARERS At last — with no fuss or bother—looseness and slipping vanish—gum soreness heals and disappears—forever.

NOT MESSY • NOT STICKY

Not a paste—not a powder—Lino-Dent is an amazing development in the field of plastics. It is the same material modern dentures are made of. That's why we can guarantee *perfect plate comfort* not for just a month but *permanently* with *one application.*

ABSOLUTELY SAFE

Lino-Dent is pure, non-toxic, non-irritating, harmless, odorless, tasteless, pleasant, simple to use. Needs no heat.

EASY AS A B C TO USE

A. Apply to Plate.
B. Insert in Mouth.
C. Bite for Perfect Fit.

It's professionally developed

YOUR MONEY BACK IF NOT COMPLETELY SATISFIED

We guarantee perfect plate comfort permanently with only one application.

SEND NO MONEY Full size package only $1 plus postage. Specify upper or lower. Or send $1 and we will pay postage.

LINO-DENT, Inc. 1199 Broadway New York 1, N. Y.

LINO-DENT, Inc. Dept. A1
1199 Broadway New York 1, N. Y.
Send LINO-DENT for:
☐ Upper ☐ Lower $1 ☐ Both—$2
I will pay postman ☐ $1 . . . ☐ $2 plus postage. My money will be cheerfully refunded if I am not satisfied.
NAME.....
ADDRESS.....
CITY..... STATE.....
Enclose payment and you save postage!

U.S. Government Surplus

New Westinghouse Generator

200 Amp. 5700 Watts 28 Volts

$39.75 F.O.B. CHICAGO

3 packed in carton $100.00

Can be converted for use as a Welder, Electro-Plater, Fast Battery Charger, Auxiliary Power Unit. Government Surplus Radio Equipment needs. This unit as quoted in article in Q.S.T. Radio Magazine. Also has many other uses. Government approved. New. Wt. 64 lbs.

Used, Guaranteed Good Condition

AVIATION ENGINE STARTER

Type 1257, Volts 24, Style A, Clutch Set at 1200 ft. lbs. 7" dia., 17" long. 50 lbs. shipping weight.

$8.95 F.O.B. Chicago

Type G-16, G-17, G-18

Mfg. by Eclipse Aviation Div. of Bendix Aviation Corp.

All prices 10% higher outside of U.S.A. proper. Sorry no C.O.D. or open account orders. All Government Surplus stocks are understandably limited, so first come first served.

GOVERNMENT SURPLUS & HARDWARE SALES

1627-29 N. Damen Ave., Chicago 47, Ill. Phone ARM 2518

BE FAIR TO YOUR HAIR Want better looking hair? Embarrassed by falling dandruff, itching scalp? Then try VITABRUSH, new electric driven scalp brush that gives your scalp a vigorous and invigorating "workout" in just three minutes of fun. Cleans scalp. Stimulates blood supply. Restful. Pleasant. Write *today* for complete information and satisfaction-guaranteed offer. Hershey Mfg. Co., 169 S. La Salle, Chicago 3

IMPORTED SWISS WRIST WATCH

Precision Made With Hands and Numbers that GLOW

Stream-lined chrome case. Smart dial with sweep second hand. Precision movement. With metal stretch band. Order today! Supply limited.

$5.95 Plus 20% Fed. Tax

SEND NO MONEY

We mail COD plus postage or send remittance, save postage.

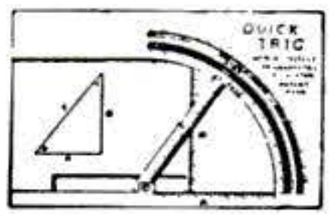
VOGUE JEWELERS Dept. PS11
1003 Locust, St. Louis, Mo.

Raise GOLDEN HAMSTERS

The new wonder animals from Syria. Look like Toy Red Bears. Delightful pets. Everybody wants them. Thousands needed by laboratories. Make money, get started now. Send 10c for illustrated literature, or send $5 for a pair of hamsters and literature.

GULF HAMSTERY 1540 BASIL ST., MOBILE 17, ALA.

LEARN TRIG QUICKLY—EASILY



WITH QUICK TRIG, by competitive tests, it was found that QUICK TRIG gave answers faster to one with a slight knowledge of trig than to an expert on trig with a slide rule. Let it solve your trig. problems. You need no previous training. Entirely automatic. Easy instructions included FREE. We mail C.O.D. plus postage or send $1.00, the full price, and we mail postpaid.

REED MFG. CO., 11350-G Burbank Blvd., N. Hollywood, Calif.

BUILD THIS FREEZER

FOR LESS THAN $50!

SAVE FOOD SAVE MONEY

Zero temperature freezes and stores 170 lbs. of meat, fruit, etc. Easy to build from steel barrels and other available material. Complete instructions and 14 view detail photo sent for..... **$1.00**

MASON FREEZERS, DEPT. S, GENEVA, N. Y.

Learn NOVELTY MANUFACTURING!!

Today's best bet for a business of your own starting with little money is the Casting of Wall Plaques, Book Ends and other Novelties. Large orders and profits waiting. Start in garage or basement, quickly learned. **NO EXPENSIVE MOLDS TO BUY.** Our system has started many on the road to a splendid financial future. Some report orders ranging from $500.00 to $5,000.00 within reasonable time after starting. Write today.

PLASTEX PRODUCTS, 711½ Laguna St., San Francisco 2, Calif.

Copyrighted material

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS!

Complete Optics! Complete Metal Parts!
Save More Than ½ Regular Cost

GOVERNMENT'S 7x50 BINOCULARS

Complete Optics, new and ready for assembly. We supply full instructions. Limit—1 Set of Metal Parts and 1 Set of Optics to a customer.

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. Bodies have been factory hinged and covered. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

Stock #842-N $39.40
Postpaid, plus $4.80 for Case—**Total $44.20**

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 X 50 Binoculars. These are in excellent condition—perfect or near-perfect—and have new low reflection coating.
Stock #5102-N . . . . . $25.00 Postpaid

NOTICE! If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

ARMY'S 6x30 BINOCULARS

No carrying Case with any Sets shown below. (None yet available in Surplus Market.) M-13A1 sets are waterproof model. M-3 sets are not waterproof. Limit—1 Set to a Customer on all Sets shown below.

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars. Everything you need—ready for assembly. When finished will look like a regular factory job costing $102 to $120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal Parts are new and perfect, all completely finished. No machining required. Bodies factory hinged and covered. Complete assembly instructions included.

Stock #830-N . . . . . $40.00 Postpaid, plus $8.00 tax—Total—$48.00

COMPLETE OPTICS & METAL PARTS—Model M-3, 6 x 30 Binoculars. The Optics in this set are new, perfect or near-perfect. Prisms have new low reflection coating. Factory mounted Eye Piece and Objective Assemblies not coated. Metal Parts are perfect, new, ready for assembly. When finished, this will look like a regular factory job, except a name has been filed off a cover plate. No machining required. Bodies factory hinged and covered.

Stock #831-N . . . . . $35.00 Postpaid, plus $7.00 tax—Total—$42.00

METAL PARTS ONLY—Model M-13A1, 6 x 30 Binoculars. No Optics. Same Metal Parts as described for Stock #830-N.
Stock #832-N—6 x 30 Metal Parts . . . . . **$25.00 Postpaid**

OPTICS FOR 6 x 30 BINOCULARS (No Metal Parts.) Perfect, and low reflection coated. **Stock #5130-N . . $15.00 Postpaid**

SAME OPTICS AS ABOVE (6 x 30) Coated—but slight seconds.

Stock #5124-N . . . . . $12.75 Postpaid

If you buy both the Binocular Optics and the Binocular Metal Parts, your purchase becomes subject to 20% Federal Excise Tax. Be sure to add amount covering tax to your remittance or your order cannot be filled.

Optics and Metal Parts are Available for Monoculars (½ a Binocular). For Complete Details, Write for Bulletin #14-N.

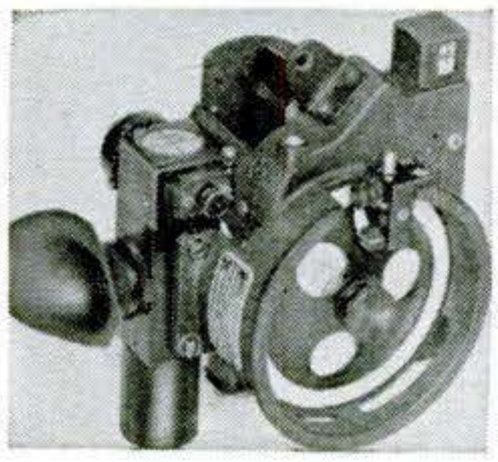
$15.00 BUYS A $500.00 TELESCOPE WITH BIG 3" OBJECTIVE

3 power instrument, brand new with plastic Optics and fixed focus. 23" long. Wt. 31 lbs. Wide field of view.
Stock #929-N . . . . . $15.00 f.o.b. Chicago, Ill.
(Shipping Wt. about 70 lbs.)

35 MM KODACHROME PROJECTING LENS SET—Consists of Achromatic Lens for projecting, plus a Condensing Lens and piece of Heat Absorbing Glass with directions.
Stock #4025-N . . . . . $1.95 Postpaid

NEVER HAS THERE BEEN SUCH A SENSATIONAL BARGAIN AS THIS!

BUBBLE SEXTANT—TYPE A-10



These Army Air Forces Bubble Sextants cost the Govt. about $125.00 each. A real bargain at our price of $12.50! Included with Bubble Sextant shipment is wooden Carrying Case, 5 spare waxed paper discs, flashlight with rheostat for night use (uses ordinary flashlight cells—not furnished) aux. 2-power Galilean Telescope, Allen wrench, 1 spare marking point. Wartime used, but where necessary completely repaired, collimated and put in good working order. If not satisfied that Sextant is exactly as represented, return within 10 days and money will be refunded. Full directions for use accompany each shipment.
Stock #924-N . . . . . $12.50 Postpaid

Same SEXTANT as above, but new with Automatic Electric Averaging Device and illuminated Averaging Disc for nighttime use. Govt. cost $217. We have checked Bubble and Collimation and guarantee perfect working order.

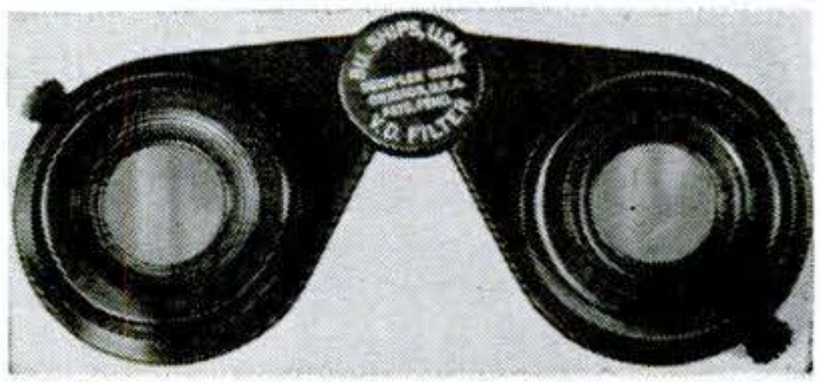
Stock #933-N . . . . . $22.50 Postpaid

CONDENSING LENSES—Seconds, but suitable for Enlargers and Spotlights.

Stock #1061-N . . . . . 6½" dia., 9" F.L. . . . . **$2.50 Postpaid**
Stock #1082-N . . . . . 4½" dia., 6½" F.L. . . . . **70¢ Postpaid**

We Have a Limited Quantity of Condensing Lenses—seconds—ranging from 4½" to 8½" in dia. with various focal lengths. Send for Free Bulletin titled **"MISCELLANEOUS CONDENSING LENSES—N"**

POLARIZING VARIABLE DENSITY ATTACHMENT FOR BINOCULARS



An amazingly effective unit for controlling amount of light reaching your eyes. Cuts down glare in sky and overwater observations. Easily snapped on and off over the eye cups of American-made 7x50 Binoculars Govt. cost $8.30 each.
Stock #20,000-N . . . . . $2.00 Postpaid

Above Polarizing Attachment also adaptable to Govt. 6 x 30 Binoculars with substitution of special Eye-cups.
Stock #20,010-N . . . . 6 x 30 Eye-cups . . . . **75¢ pr. Postpaid**

MOUNTED PROJECTING LENS SYSTEM

F.L. 91.44 mm. (just right for 35 mm. Projectors). Speed of F 1.9. Outside dia. of mount at one end 60 mm. Length of mount 64 mm.
Stock #4033-N . . . . . $3.00 Postpaid

MOUNT FOR ABOVE PROJECTING LENS SYSTEM
Stock #715-N . . . . . $1.50 Postpaid

LENS CLEANING TISSUE—1st quality, sheet size 11" x 7½". Made to Govt. specs. Won't dust. Free of abrasives and lint.
Stock #721-N . . . . . 500 sheets . . . . . **$1.00 Postpaid**

SCHMIDT OPTICAL SYSTEM. Black plastic body, size 3-15/16" by 5-½". F.L. 2.4" . . . . . with amazing speed of F.O.9. Used in Navy's Infra-Red Sniperscope and Signalling Units. Govt. cost $134. Limit—1 to a customer.
Stock #720-N . . . . . $6.00 Postpaid

AIR FORCES GUN SIGHT—With Polarizing Variable Density Attachment. (Polarizing attachment alone is worth many times the price of entire unit.)
Stock #908-N . . . . . $5.00 Postpaid

Same Unit Without Polarizing Attachment
Stock #916-N . . . . . $2.50 Postpaid

We have literally millions of war surplus lenses and prisms for sale at bargain prices. Write for Catalog "N"—Sent Free!

SATISFACTION GUARANTEED • ***Order by Stock No.***

EDMUND SALVAGE CO., P. O. Audubon, New Jersey

Copyrighted material

VETERANS Learn WATCHMAKING

A Lifetime Career

No Age, nor Physical Limitations

YOUR OPPORTUNITY

To Lift Yourself from a Futureless Job

LEARN WATCHMAKING

and earn, from the start, higher than average pay . . . easy hours . . . ideal working conditions . . . be prepared to establish your own business.

WATCH REPAIRING—JEWELRY—ENGRAVING

Always in Demand

Requests for our Graduates from Everywhere. Permanent positions (no layoffs) $75.00–$100 per week for trained men. Write today for latest FREE Catalog.

KANSAS CITY SCHOOL OF WATCHMAKING

America's Most Progressive Horological School

619 WYANDOTTE ST. KANSAS CITY 6, MO.

Do you want

..to go to College?

..or to enter a Profession?

(Such as Accounting, Architecture, Nursing, Dentistry, Teaching, Social Work, Osteopathy, Beauty Culture, Optometry, Embalming, Chiropody, Law, Medicine, etc.)

..or get an Office Position?

To get anywhere, you practically MUST finish High School FIRST. You can complete our simplified High School Course in SPARE time at home, as FAST as your time and abilities permit. Equivalent to resident school work—prepares you for college, pre-professional examinations, business, industry. Standard texts furnished. Diploma. Credit for H.S. subjects already completed. Single subjects if desired. Low tuition, easy terms. American School, Chicago, est. 1897—endorsed by educators. Finish your high school education NOW. Write TODAY!

High School Course at Home

Many Finish in 2 Years

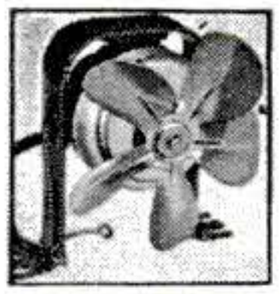
American School, Dept. H846, Drexel Ave. at 58th St., Chicago 37

Gentlemen: Send me FREE information covering special training in subjects checked below. No obligation on my part.

- ☐ High School Course
- ☐ Electronics, Industrial
- ☐ Architecture and Building
- ☐ Automotive Engineering
- ☐ Business Management
- ☐ Electrical Engineering
- ☐ Elec. and Gas Refrigeration
- ☐ Air Conditioning
- ☐ Railway Training
- ☐ Diesel Engineering
- ☐ Drafting and Design for Men and Women
- ☐ Plastics
- ☐ Private Secretary
- ☐ Mechanical Engineering
- ☐ Aviation
- ☐ Salesmanship
- ☐ Radio

Name .....

Address .....



DELCO MOTORS

Fractional H. P. Delco factory tested and guaranteed long life motor. Triple rubber mountings. Noiseless operation. 2-wire rubber cord. 110V. A.C., 60 Cy. Airflow 1000 C.F.M. For cooling and ventilating purposes in Offices, Shops, Homes, also for Refrigeration Units. ¼" shaft. Blade size 6½". Stand 6¼" high, 4" wide. Complete as shown. Shipping weight 4 lbs.

No. 7014 Suction Type
No. 9272 Blower Type.....EACH **$5.25**

Lots of 10..**EACH, $4.90** Plus postage Lots of 50..**EACH, $4.75** Plus postage

FREE CATALOG—Send for new G. & E. APPLIANCE & PARTS CATALOG.

G. & E. Equipment Supply Co.

Dept. P.S. 9, Ogden Ave. at Fulton, Chicago 7, Illinois

Learn to MOUNT BIRDS

Tan SKINS, make up FURS

Be a Taxidermist. *Double your hunting fun.* We teach you **at Home.** Mount **Birds, Animals, Fish, Heads,** common specimens. **Fun and profits.** Decorate home and den **MAKE MONEY.** Mount game, tan for others. Big profits in spare time. **WRITE TODAY.** **100 game pictures in FREE BOOK** Hunters, get your copy. It's **Now Free.** Send post card. State your **AGE.**

FREE BOOK

NORTHWESTERN SCHOOL OF TAXIDERMY
Dept. 3388 **Omaha, Nebraska**

BOOKS FOUND

Scarce, out-of-print, unusual books quickly supplied. Prompt service. Reasonable prices. Books sent prepaid. Any subject. No obligation. Send list of books wanted. 30 years in book business.

CLIFTON COMPANY, Box 1377, Dept. PSD, Beverly Hills, Calif.

ANALYZE *Handwriting*

Uncrowded, fascinating field. Gratifying earnings reported by graduates in Employment, Credit, Social Service, Police and Entertainment fields. Others have developed profitable private practice, full or spare time, as Personal Problem and Vocational Counselors. Send for 3000 word TEST LESSON and Grapho Analyst FREE.

FREE BOOK and LESSON

A. I. G. A. Inc., Wilhoit Bldg., Dept. 126, Springfield, Mo.

Poise Power Personality THRU Mind Mobilization

Consult our Psychologist in your own home. Learn to overcome nervousness, anxiety, fears, marriage difficulties, physical distress, and undesirable personality traits. For HAPPINESS, HEALTH, SUCCESS, write today for FREE Personality Check-Up and details of our Personalized Homestudy Course in Personal Adjustment.

Extension Dept., School of Modern Psychology
134 E. Second St. **Dayton 2, Ohio**

Everyone Can Afford This LATHE!

• For Farms, Home Work Shops, Model Builders, Hobbyists

There's hardly a hobbyist, workman, farmer or tinker who can't buy this metal turning lathe! Use it to earn money; develop inventions; make repair parts; do machine work on models. Has V-Way Bed, automatic power feed; OTHER BIG FEATURES, 8" Swing; 10" between centers; ½" hole through spindle; 22" bed. Weighs 72 lb. Guaranteed. Price complete, except motor, f.o.b. Lansing..... **$45**

SEND FOR FREE LITERATURE!

Rosemoor Mfg. Co. 2607 Bernice Rd. Lansing, Illinois

Copyrighted material

LIKE TO WORK WITH YOUR HANDS? THEN GET INTO ELECTRIC APPLIANCE Repair & Service

OPEN YOUR OWN SHOP

Here's a great growing field that's getting bigger every day as more houses are wired for electricity. You can start small—even in your spare time—with the tools we send you—in your basement or garage and GROW AS BIG AS YOU LIKE, with NO FEAR OF LOSING YOUR JOB in a depression. Or, you can take a well paid job, to start . . . as there is a big need for service mechanics. Let's talk it over by mail.

Recent University Discoveries prove that one of three major classifications of men are only thoroughly happy when working with their hands. This doesn't mean they don't use their heads, too. But it does mean that nature intended A BIG GROUP of men to be the builders, makers, fixers and servicers of life. If you are in this group—not completely happy in your present work—seeking increased income and handy with tools—A SUGGESTION:

LEARN AT HOME In Your Spare Time

Our practical, thorough course teaches you this interesting, good paying business AT HOME—**During Your Spare Time.** A Grade School education is all you need. We teach repairing washing machines, vacuum cleaners, electric ranges, lamps, irons, motors, etc., REFRIGERATION and HOUSE WIRING. Our lessons are understandable and easy to grasp. You'll enjoy every minute of them. And you'll enjoy the work itself when you get into it.

I Include A BIG KIT of Special APPLIANCE TOOLS at NO EXTRA COST

NEW BOOK "HOW TO START YOUR OWN BUSINESS"

Sent at No Extra Cost

This valuable book covers locating your shop, contains drawings of how to build and wire workbenches, where and how to advertise, what to charge, how to hire solicitors, etc. Sent to students who enroll promptly.

MAIL COUPON for FREE BOOKLET

H. T. Armstrong, General Manager
PACIFIC TRAINING SCHOOL—Dept. S-111
7217 So. Broadway, Los Angeles 3, Calif.
Please send me your FREE BOOKLET:
"Today's Big Opportunity—Appliance Servicing"

NAME _____ AGE _____

ADDRESS _____

CITY _____ STATE _____

ROCHESTER'S world-famous industries WANT PATENTS

For further information, write to the Division of Public Relations, Rochester Department of Commerce, 54 Court St., Rochester 4, New York.

"A City of Rochester Service"

TRAVEL - for 'UNCLE SAM'

RAILWAY POSTAL CLERKS

$2,300 First Year regular

MANY OTHER GOVERNMENT JOBS

Postoffice Clerks—Mail Carriers—Stenographers—Typists, Statistical Clerks—Storekeeper—Gauger, etc. 32 Page Civil Service Book—FREE.

MEN—WOMEN

Veterans Get Preference

Mail Coupon immediately—today sure.

$1,756 to $3,021 FIRST YEAR

COUPON

FRANKLIN INST., Dept. P80, Rochester 4, N. Y.

Gentlemen: Rush to me, without charge, 32 page book with list of U. S. Government big paid positions. Advise me also regarding salaries, hours, work, vacation, etc. Tell me how to prepare for a position.

Name .....

Address ..... Vet? .....

Copyrighted material

Rheumatism Yields To Drugless Method Of Treatment

Excelsior Springs, Mo. So successful has a comparatively new, drugless method proven for treating rheumatism and arthritis that an amazing new book will be sent free to any reader of this paper who will write for it.

This book entitled, "Rheumatism," fully explains why drugs and medicines give only temporary relief and fail to remove the causes of the trouble.

The Ball Clinic, Excelsior Springs, Mo., has perfected a system of drugless treatment for rheumatism and arthritis combined with the world famous mineral waters and baths. This new system of treatment is fully described in the book and tells how it may be possible for you to find freedom from rheumatism.

You incur no obligation in sending for this instructive book. It may be the means of saving you years of untold misery. For writing promptly, the company will also include a free copy of the book entitled, "Good Health, Life's Greatest Blessing." Address your letter to The Ball Clinic, Dept. 36, Excelsior Springs, Mo., but be sure to write today.

New Advertising Machine

Prints & Illustrates 1c Post Cards

FREE! Learn how thousands of merchants and business men are boosting sales in spite of product shortages *with 1c messages*—printed in a few minutes on gov't postcards—with amazing new, patented CARDMASTER. Your "todays" ideas for specials, read by prospects next morning. Not a toy, but a sturdy, advertising machine, built to last many years. Low price, sold direct. Guaranteed, five years.

SEND NAME We'll send free illustrated book of money-making ideas for your business and complete, unique advertising plans. Rush your name today.

CARDMASTER COMPANY
4546 Ravenswood, Dept. 1611, Chicago 40, Ill.

FIREWORKS!
CHINESE FIRE CRACKERS
Immediate Delivery

80/16—1½ Jolly Brand ..... $4.50 per bundle
80/20—1½ Jolly Brand ..... 5.35 per bundle
80/16—1⅝ Cock Brand ..... 5.50 per bundle
80/20—1⅝ Cock Brand ..... 6.50 per bundle

SMOKE BOMBS Per Case of 25 **$10.00**

TERMS CASH WITH ORDER
UNITED FIREWORKS MFG. CO., INC.
DAYTON 7, OHIO

STERLING SILVER
LADY LUCK HORSE SHOE *Ring*

Statuesque Horse's head, horse shoe and 4-Leaf Clover design. Handsomely formed from solid Sterling Silver. Oxidized, hand-buffed finish. Styled for men or women.

SEND NO MONEY! Just clip ad and mail with name, address and ring size. Pay postman only $3.98 (tax included) plus postage. Wear for 5 days. If not delighted, return for full refund.

WESTERN CRAFTSMEN Dept. 596 1904 Farnam St. Omaha 2, Nebr.

LATHE OWNERS—ATTENTION

If your present metal lathe is without power cross-feed, you can now build your own. All parts available from your nearest mill supplier or jobber and scrap box. Positive non-slip performance—no belts used. Adaptable to all metal screwcutting lathes. Make the most of this winter in your shop. Detailed pictorial drawing and complete instructions sent postpaid $2.95. Send Money Order today to:

JAMES B. WATERS, JR., Dept. A,
4412 Georgia Ave., N.W., Washington 11, D. C.

Become a Doctor of PSYCHOLOGY

Win the degree of Ps.D. Teach the secret of contentment, happiness. Solve mental worries. Experience the revelation of truth. Chartered college. Individual help. Write for FREE book. **COLLEGE OF UNIVERSAL TRUTH, 5153-A North Clark St., Chicago.**

BE A SIGN PAINTER!

Learn by QUICK METHOD to paint signs. My artistically true and practical SYSTEM is the result of FORTY YEARS of experience and study in nationwide display work. Write today—NOW—for particulars.

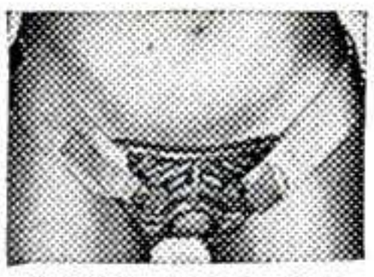
CAHANEY SIGN SYSTEM 1013 SOUTH 3RD ST. DENNISON, OHIO

New Designs in
FRANZITE GRIPS

Modernize Your Gun! Improve Your Score!
Most durable grips made. Positively unbreakable! For Colt, Smith & Wesson, Hi-Standard. Ortgies, Luger & Mausers in a wide choice of beautiful designs in ivory, pearl, walnut, onyx, etc. Low prices. FREE CATALOG. Dealers Wanted.

SPORTS, INC., (Mfrs.) 5501 Broadway, Dept. S-11, Chicago 40, Ill.

REAL RELIEF *FOR* RUPTURE

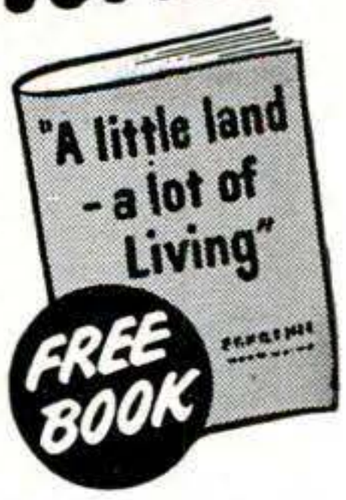


Thousands of wearers tell of **real relief.** Scientifically shaped, made of strong washable materials, gives the RIGHT support WHERE NEEDED. Satisfaction GUARANTEED. Write for FREE literature NOW.

The WEB Truss Co. Dept. S-16, Hagerstown, Md.

Copyrighted material

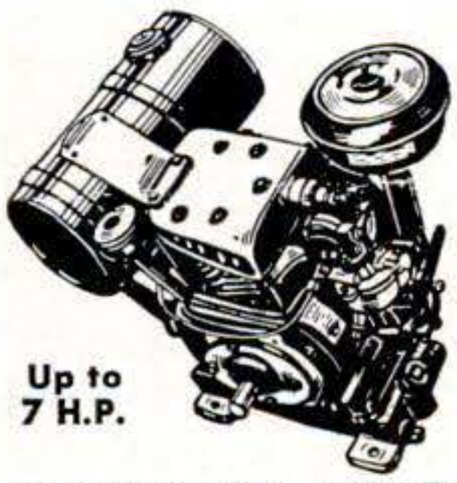
HOW TO DO WONDERS ON AN ACRE!



MY WIFE and I would like to send you our FREE BOOK about our "HAVE-MORE" PLAN for "a little land—a lot of living." Tells how to do wonders with a garden, fruits, berries, poultry, livestock, etc.—all on small scale—in spare time. Many new devices, scientific methods. Special house plans and layouts for small acreages. It's a whole wonderful NEW SCIENCE of living—a healthier, happier, more independent life—on the little place you've always dreamed of having. Just drop us a post card today for our FREE BOOK—32 pages—50 illustrations.

ED ROBINSON • BOX 2811 • NOROTON, CONNECTICUT

GASOLINE ENGINE



Up to 7 H.P.

Used Gov't Surplus — Air-Cooled Briggs-Stratton or Wisconsin Engine. Our sale price F.O.B., K.C. **$99.50**

Also LIGHT PLANTS

3,000 Watt, 110 volt. Sale Price F.O.B., K.C. **$124.50**

Write for illustrated circular — Immediate delivery

MIDWEST SURPLUS SALES 1520 Locust St. Kansas City, Mo.

STAMMER?

This new 128-page book, "Stammering, Its Cause and Correction," describes the Bogue Unit Method for scientific correction of stammering and stuttering—successful for 46 years. **Benj. N. Bogue, Dept. 7853, Circle Tower, Indianapolis 4, Ind.**

CARTOONING

HAVE FUN! MAKE MONEY! Cash in on your sense of humor at HOME—BY MAIL. No experience needed to start. Write today FOR FREE TRIAL LESSON and full particulars.

MooN Gag Cartoon School, Dept. C, Fall Creek, Wis.

MAKE UP TO $1000.00 A MONTH

Own Your Own Business Now!

Make more money the modern way. Send for FREE bulletin No. 11A for details on the Modern Lawn Mower Sharpener.

MODERN MANUFACTURING COMPANY
160 N. FAIR OAKS, PASADENA, CAL.

QUICK MONEY! **"REPAIRING CAR BATTERIES"**
At Home! Easy Too! Free Circulars!
WRITE, BATTERYMAN Dept. S-1 Grand Junction, Colorado

LEARN WATCH *and* CLOCK REPAIRING

Start training now for a better paying job or your own profitable business. Qualified Watch Makers are in demand . . . Unlimited opportunities. Intensive practical training by experienced watch makers. Veteran operated. Write for full details.

SCIENTIFIC SCHOOL OF WATCH MAKING, Dept. PS-11
3923 San Fernando Road Glendale 4, Calif.

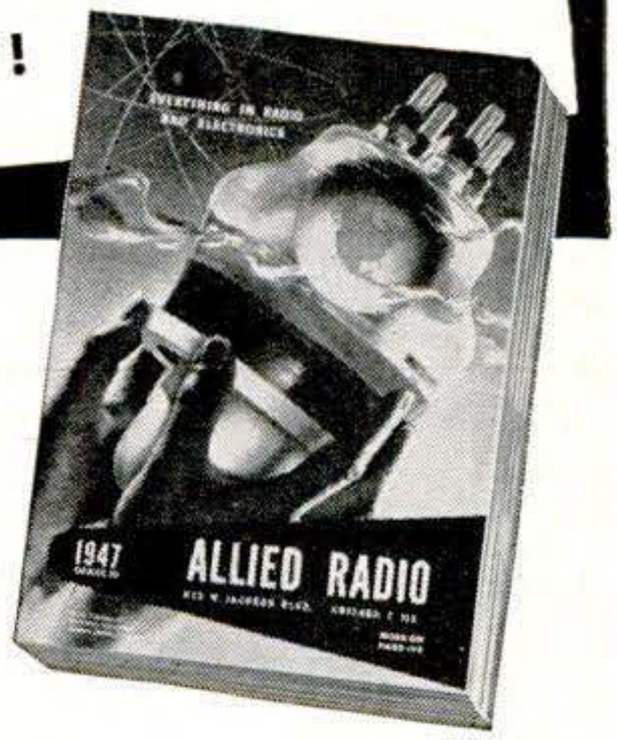
FREE MEMBERSHIP "STRONG MEN'S CLUB OF AMERICA"

Send for your personal Membership Card today! Enjoy strength secrets! No dues! No obligations! Send name, address and age on penny postcard.

STRONG MEN'S CLUB OF AMERICA
Joe Bonomo, *Director* Dept. 1211
1841 Broadway, New York 23, N. Y.

FREE SEND FOR ALLIED'S Big 164 Page RADIO CATALOG!

WRITE TODAY!



SAVE ON EVERYTHING IN RADIO!

NEW HOME RADIOS

SERVICE SUPPLIES
BUILDERS' SUPPLIES

AMATEUR GEAR

SOUND SYSTEMS

164 Value-Packed Pages

Send for your FREE copy of the most complete Buying Guide for Everything in Radio! Here's the Catalog for Servicemen, Dealers, Soundmen, Amateurs, Builders and Experimenters. Features the world's largest and most complete stocks of radio and electronic supplies—quality equipment at lowest prices! Get the speedy service and expert help you want from ALLIED—Radio's Largest Supply House. Depend on ALLIED!

MORE THAN 10,000 ITEMS

Get everything for every radio use: Latest type home radio models, phono-radios, recorders, communications receivers, Ham kits, and gear, code apparatus, radio parts, tubes, tools, test instruments, public address equipment, low-cost easy-to-build radio kits, diagrams and matched parts lists, largest selection of instructive radio books —all at lowest prices!

ALLIED RADIO

FREE CATALOG

ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-LL-7
Chicago 7, Illinois

☐ Rush FREE 164-Page Catalog

Name.....

Address.....

City.....*Zone*.....*State*.....

Copyrighted material

BARGAIN

3X ARMY TELESCOPE

Original Cost $150.00 — Our Price $7.50

ALL COATED LENSES — BRAND NEW

An ideal gift for viewing objects, landscapes, seashores, etc. The high resolving power of the six coated lenses, five of them achromats will bring out great details. For the experimenter it can be dismantled and used for hundreds of projects. Length 22½ inches, 36° Field. **Postpaid $7.50.**

500,000 Lenses and Prisms. **Send 3c stamp for "Bargain" List**

A. JAEGERS

123-26B ROCKAWAY BLVD., SO. OZONE PARK 20, N. Y.

SOLID BRASS 12 FT. PORTABLE

RADIO ANTENNAS

Real $15 Value Now Only $4.95 Postpaid

FOR HOMES, BOATS or AUTOS

Just Out! Gov't surplus used on Army tanks. These telescopic rustproof antenna have tremendous pickup eliminate dangerous wiring. Solid Brass throughout practically insuring NOISE FREE RECEPTION.

12 Exceptionally Rugged Sections compress into 1 ft. 4 in. Handy for Camping Trips, also Useful for Transmitting, FM & Television sets.

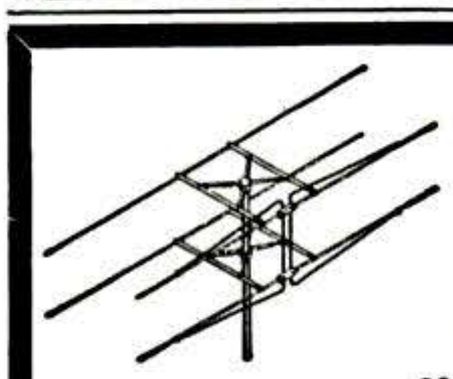
Each antenna comes with clamps, nut, lug, and wire. Easy to install anywhere.

QUANTITY LIMITED

ORDER TODAY. A real $15 value for only $4.95 Postpaid. Mail check or money order now or sent C.O.D. plus postage. Money back in 10 days if not satisfied.

RADIO HOSPITAL 442 East 86th St., Dept B11 NEW YORK 28, N. Y.

TELEVISION



Antennas-also FM and Amateur

IMMEDIATE SHIPMENTS
LOWEST PRICES

Available at the Better Dealers

Send for circular

S/C LABORATORIES, INC.

20-22 Van Wagenen St., Newark 4, N. J.

Say You Saw It
In Popular Science

THIS IS THE BUSINESS YOU DREAM ABOUT

QUICK STEADY PROFITS

CORADIO

The Coin Operated Radio

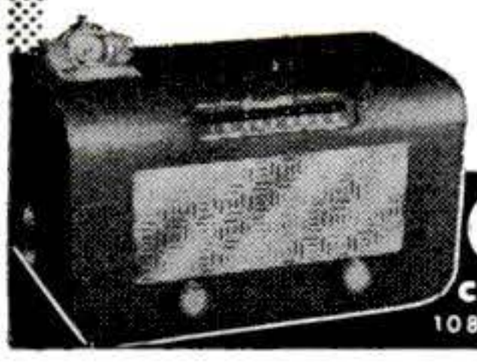
IT'S the new, fast-growing, depression-proof business. Coin operated radios are placed in hotels, tourist courts, clubs, hospitals, etc. on a commission basis—play 1 or 2 hours for 25c and produce immediate profits. The best coin operated radio is CORADIO

ACT NOW

Start your own lifetime business, full or part time.

Send For Free Catalogue And Complete Information.

***WRITE TODAY* Dept. P.S.**



CORADIO

COIN OPERATED RADIO

108 W. 31st ST. N.Y 1, N.Y. WISCONSIN 7-5902

SALESMEN WANTED

Sell FIRE PROTECTION

You can Establish a Profitable Business Handling America's Largest Fire Extinguisher Line.

Sell Fyr-Fyter extinguishers direct to schools, factories, stores, homes, farms, hotels, car owners, etc. **Unlimited market.** Present scarcity of building materials and labor make fire protection essential. Six-year pent-up demand. **No limit to earnings.** Profit checks mailed weekly. We carry accounts, ship direct.

Not a "one-shot" promotion but your opportunity to establish a permanent, profitable business. Not just one product but a complete line. Underwriters' approved, from 1 qt. to 40 gals. All major types. We train you while you earn. AAA company, 31st year.

Write for details of the nationally famous Fyr-Fyter sales plan. This may be it.

DEPT. 92-35, **FYR-FYTER CO.,** DAYTON 1, O.

Big New Novelty Catalog Now Ready!

500 Pages; 6000 Amazing Novelties

10c

Send **10c** today for this mammoth, amazing new catalog of over 6,000 novelties. More fascinating than a World's Fair. Thousands of things you never knew existed—never knew where to get. Includes **novelties, tricks, jokes, live animals and pets, scientific supplies, den novelties, hobby supplies, planes and boats, looms, magic, unusual seeds, gadget time savers, cameras and optical goods, movies, projectors, lucky jewelry, religious novelties, telegraph sets, magnets, disguises, easy musical instruments, stamps, coins, puzzles, fortune tellers, occult and supernatural, radios, experimental sets, auto & bike accessories, Western belts and wearing apparel, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines and motors, electric shockers, knives, billfolds, fireworks, guns and rifles, weird articles, archery, swimming helps, 1000 fascinating books, games, locks, live chameleons, rings, watches, charms, barometers, fireworks, imported novelties, exercisers, money savers, handy tools, Indian novelties, etc., etc., etc.** Jammed and packed with sensational funmakers and useful articles. Big catalog—over 1 inch thick, 6 color cover. **(DeLuxe Hard Bound Library Edition 25c Postpaid). Regular paper covered edition, 10c. Send today!**

JOHNSON SMITH & CO., Dept. A-4. Detroit 7, Mich.

EYE GLASSES BY MAIL

FREE ...of extra charge: Eye Glass Case, Wiper, Eye Glass Cleaner with Each Order!

• 30-DAY TRIAL OFFER

NEWEST STYLES. Write today for **FREE** Catalog, Full Information, Low Prices, Scientific Sight Test Chart!

SEND NO MONEY

POSITIVE MONEY-BACK GUARANTEE

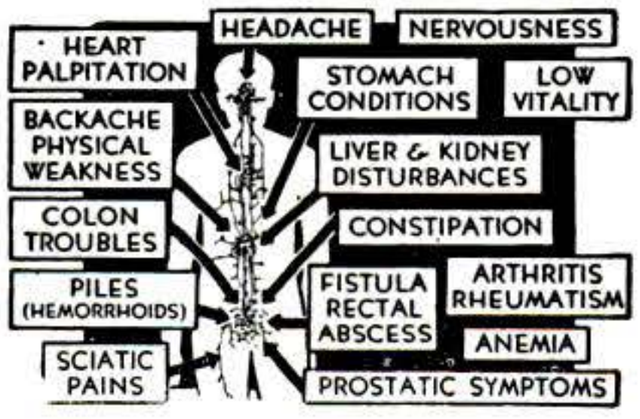
LOW AS $1.95 AND UP

LEE EYE GLASSES CO.

4148 Easton, Dept. Q-2, St. Louis 13, Missouri

Fistula Is Real Threat

FREE BOOK — Explains Other Related Ailments



40-page FREE BOOK—tells facts about Fistula, Rectal Abscess, Piles and other rectal and colon disorders; also related ailments and latest corrective treatments. Thornton & Minor Clinic, Suite 1149, 926 McGee, Kansas City, Mo.

Copyrighted material

PAINT YOUR CAR WITH WYPE for 3.95

Amazing NEW AUTO ENAMEL

You WIPE ON Instead of Brushing or Spraying

Get Beautiful Mirror-Like Finish That Looks Like Spray Job!

At last! Practically anyone can now paint his car with **WYPE** and get a beautiful high-gloss job that gives you an expensive finish such as is sprayed on by Professional Auto Painters—at a fraction of regular cost! With WYPE you need **NO BRUSH, NO SPRAY, NO MASKING!** Just **WIPE ON** with Powder Puff—which we furnish at no extra charge. You get a brilliant, glossy finish that is truly "factory-like." No streaks. No lap-marks. Guaranteed for TWO years not to crack, peel, chip or fade, if simple directions are followed. Takes about an hour to apply. Dries dust-free in an hour. WYPE comes in eight most popular shades including those on newest model cars. Goes over any other color, lacquer or enamel.

NEW MONEY-MAKING BUSINESS!

WYPE 2 CARS DAILY for $25.00 each—

Gross Up to $260.00 Weekly Profit!

Start making BIG MONEY Now! Sell WYPE in cans or go into business painting cars yourself (or hire others to do work). Send for FREE details of powerful money-making plan. Why wait! Start now by ordering one quart or more of WYPE!

SEND NO MONEY! ORDER WYPE TODAY!

Color	Price Per Quart
BLACK	$3.95
GREEN (Brewster-Dark or Jewel-Light)	3.95
BLUE (Washington-Dark or Monticello-Light)	3.95
GRAY	3.95
RED or MAROON	3.95

Order one quart or more today! SEND NO MONEY! Mail penny postcard. Then pay your mailman for WYPE plus postal charges. Or, if you send money with order, WE pay postage. See your dealer or order direct.

ONE QUART DOES ENTIRE JOB! DRIES TO GLISTENING PROFESSIONAL FINISH!

WYPE is a new Miracle Enamel for Autos. It is NOT a wax or polish but a hard high lustre ENAMEL finish! With WYPE, **ANYONE** can do a beautiful job! Order a quart to paint your car or to get started in this BIG-MONEY Business!

WYPE CORP. Dept. 60-M, 2214 Dolman St. ST. LOUIS, MO.

LEARN MEAT CUTTING EASILY-QUICKLY At Home-In Spare Time

The steady, dependable trade of Meat Cutting taught easily, quickly by improved HOME METHOD. National School, established over 25 years, has organized its famous "Learn By Doing" Classroom, Cutting room and Retail Market training system into sound, practical HOME STUDY form.

Now, by the miracle of this EXTENSION TRAINING you can prepare in Your Spare Time At Home, for a better job, bigger responsibilities or success and security in a store of your own. Remember, PEOPLE MUST EAT!

Buying, cutting, percentage, pricing, advertising, selling—a complete meat education. For beginner or men with experience. Thousands of successful graduates. Send coupon for FREE Bulletin NOW!

MAIL THIS COUPON TODAY FOR FREE BULLETIN

National School of Meat Cutting Div. 060, Toledo 4, Ohio

Send me your FREE Bulletin on Meat Cutting and Meat Merchandising. No obligation. No Salesman will call.

Name.....

Street.....

City.....State.....

Copyrighted material

MODERNIZE Mother's SEWING MACHINE

MAKES SEWING A PLEASURE! ELECTRIFY IT!

A COMPLETE SEWING MACHINE MOTOR KIT that is adjustable for use with any type of Sewing Machine. Anyone can install it in a few seconds. The complete set consists of Universal AC or DC, 60 Cycle, 115 Volt Motor and Bracket; Long wearing Belt; Single Grooved Steel Hubbed Pulley; New, Improved Bracket; Foot Control (7 Step Rheostat); Extension Cord Set with Plug and Socket.

OUTFIT CAN ALSO BE USED TO MOTORIZE MANY OTHER APPLIANCES WHERE CONTROL IS NEEDED.

$18.95 COMPLETE

PASAAK'S DEPT. PS
BOX 153, CANAL ST. STATION
NEW YORK 13, N. Y.

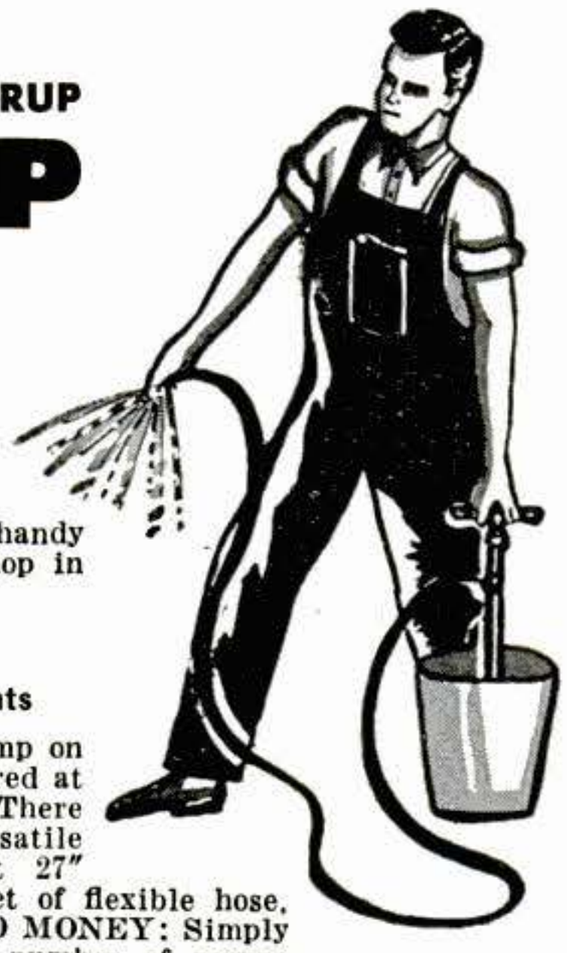
NOW! EXTRAORDINARY New GOV'T RELEASE!

Shoots A High Pressure Stream Of 30 Feet!

ALL PURPOSE STIRRUP

PUMP

ONLY $1.49 EACH



The Tool of 100 Uses!

Just the thing for
- **FIRE FIGHTING.** A very handy tool to have in your workshop in case of fire.
- **Spraying Garden**
- **Washing Cars**
- **Bailing Boats and Basements**

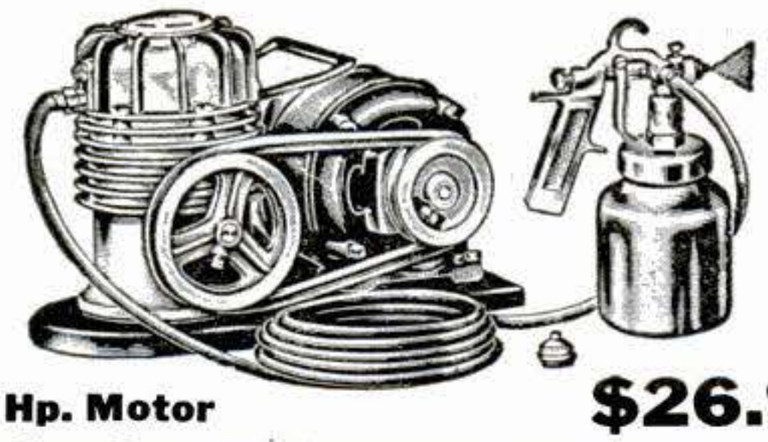
Finest quality all purpose pump on the market! Never before offered at this ridiculously low price. There are dozens of uses for this versatile sprayer Approximate height 27" overall. Complete with 10 feet of flexible hose, ready for assembly. SEND NO MONEY: Simply send name and address and number of pumps desired and we will promptly mail your order C.O.D. plus 25c for postage. If you prefer send $1.49 plus 25c for postage with order.

S & B SURPLUS SALES CO., Dept. PS
2905 W. Madison St. Chicago 12, Ill.

Speedy Paint Sprayers

LESS MOTOR

SPRAY GUNS — COMPRESSORS



Uses ¼ Hp. Motor **$26.95**

No. 890 Complete as illustrated, less motor **$26.95**
No. 444 Outfit, twin cyl. complete less motor **$47.50**

NEW BLACK & DECKER DRILLS—110 AC-DC
Jacobs hex-key chuck
¼" 2250 rpm. Drill **$18.95**
½" 375 rpm. Drill **35.95**

POWER TOOLS, RADIOS, TOYS

Special—Closing Out All Hobbycraft Supplies. Send for Bargain List.

IMMEDIATE DELIVERY—Check or M.O. with order, shipped prepaid. West of Mississippi add 5%. Or we will ship C.O.D., plus charges. Write for **FREE** Catalog today!

INDIANA APPLIANCE CO.
20 E. Sycamore Dept. PS-120 Evansville, Indiana

APTITUDE TESTS

discover the kind of work or studies best for your success! You get a personal report—a guide for life—more happiness—more prosperity. (for men, women, boys, girls.) Write for complete facts

VOCATIONAL COUNSELING INSTITUTE
5057 Woodward Ave., Detroit 2, Michigan

BE A NAVIGATOR

OF SHIPS • OF PLANES

Train at home, in spare time for a fascinating, good pay job in marine or air navigation. Weems Course enables you to meet CAA requirements for commercial airline navigators—and navigation requirements for Master's or Mate's license in Merchant Marine. Many Weems graduates now officers in Navy, Coast Guard, Army-Navy Air Forces and Commercial Airlines. Write today for free descriptive catalog. G. I. Plan.

WEEMS SCHOOL OF NAVIGATION, Dept. 3, Annapolis, Md.

MUFFLERS
STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev, V-8, Plymouth, Steels $5.50, Aluminum $6.50. Chry., Olds., Buicks, etc., Steels $7.50, Aluminum $8.50. V-8 and MERCURY DUALS, Steel $17.50, Aluminum $20.00. Aluminums are guaranteed for life of your car.

DEALERS WANTED

SANDEE MUFFLER CO.
7523 S. WESTERN AVE., LOS ANGELES 44, CALIF.

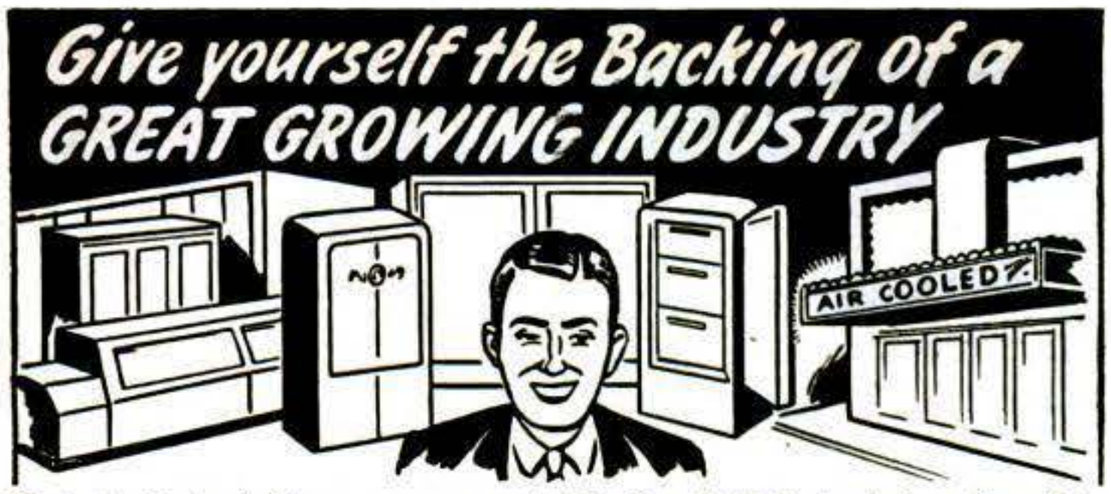
RUPTURED?

Get Relief This Proven Way

Why try to worry along with trusses that gouge your flesh—press heavily on hips and spine—enlarge opening—fail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening—follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing **FREE** book, "Advice To Ruptured," and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

Cluthe Sons, Dept. 14, Bloomfield, New Jersey

Copyrighted material



REFRIGERATION AIR CONDITIONING

Begin Training at Home or Come Directly to Shops

Get started right—prepare quickly by C.T.I. training for this big, fast growing industry. Good pay—widespread demand for trained men. Practical home training or shop training for ambitious men who want to service, install, maintain, repair, rebuild household and commercial refrigerators. Get into this field now—take advantage of important new developments such as Frozen Foods and the many new industrial uses. According to newspaper report, "Engineers in the (air conditioning) industry say future expansion is virtually unlimited." Demand for commercial refrigeration installations in restaurants, butcher shops, taverns, florists, bakeries, etc. Yes—get into refrigeration and air conditioning now—get in now while the time is ripe and you have the chance to build a successful, lasting future.

START NOW - *Full and Part Time Earnings*

There may never again be such opportunities for men who want better jobs or business of their own to get in on ground floor and go up fast! Many started with small investment who built good, growing business. CONSULTATION AND PLACEMENT SERVICE.

Nationally Known

C.T.I. was only civilian school selected by Army to train service men for refrigeration. Same quality training available to you now.

VETERANS

Tuition paid by Government plus monthly subsistence allowance while in school. Just mail coupon, we will handle all details. (LOW TUITION, EASY TERMS if you are not a veteran.)

Begin your training at home in spare time, finish in our big, modern shops, or come directly to shops. At home you get C.T.I.'s SHOP PROVED HOME STUDY instruction—actual shop experience has gone into the practical lesson assignments. That is why it is easy for mechanically inclined men to learn by our Home Training and start on actual refrigeration work.

Commercial Trades Institute
1400 W. Greenleaf, Chicago 26, Ill.

FREE Big Illustrated Picture Book Mail Coupon

Fill Out, Cut Out, Mail Today

FACTS FREE for Men Who Want to Get Ahead

Commercial Trades Institute, Dept. A-111
1400 W. Greenleaf, Chicago 26, Ill.
Send free illustrated Picture Book and other information about Refrigeration and Air Conditioning.
( ) Veteran ( ) Non Veteran

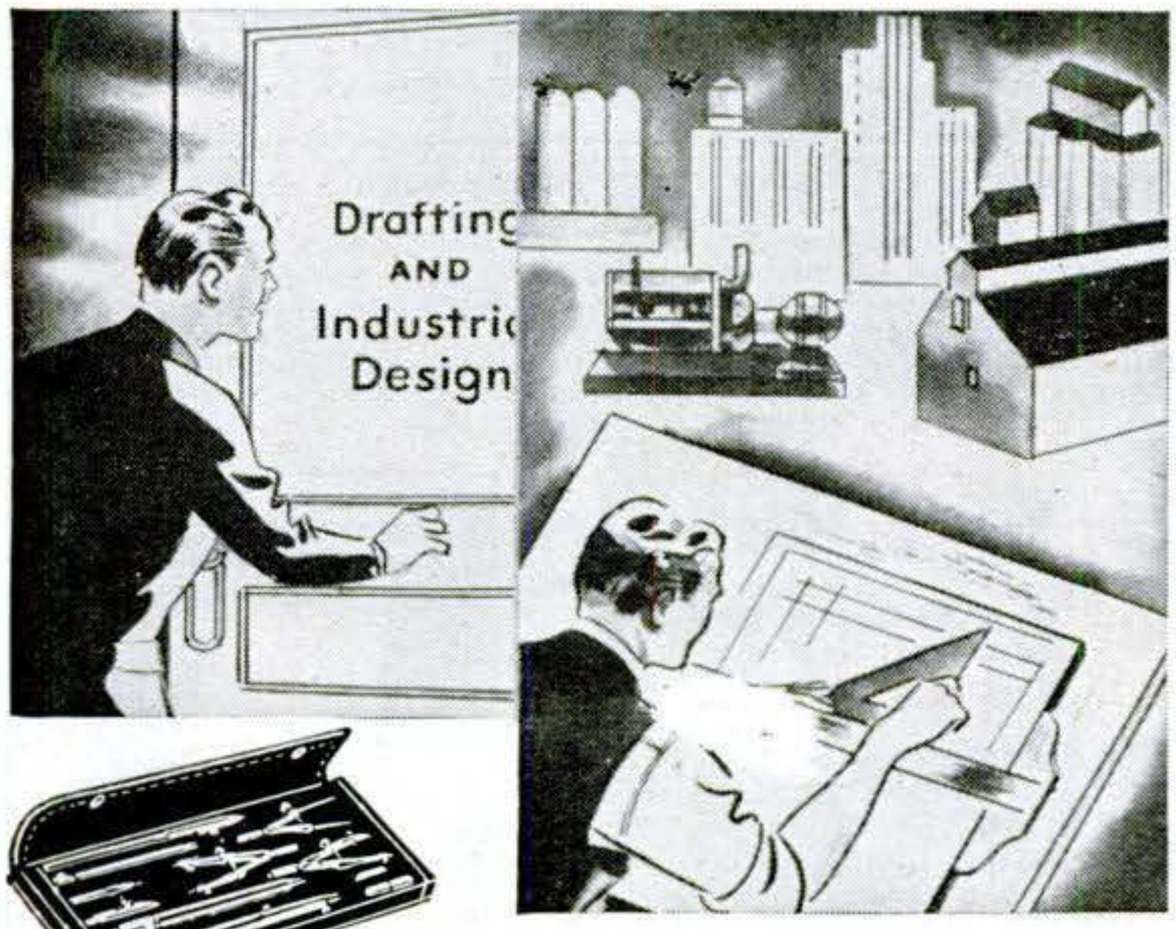
Name.....

Address.....

City.....State.....

LEARN DRAFTING NOW FOR BEST OPPORTUNITIES IN ALL THE BIG OPPORTUNITY FIELDS!

Engineer Dobe



I Will Train You at Home Until You Get a GOOD PAY JOB!

Engineer Dobe

Plan now for a better job and better pay as America surges into the biggest production record in history. Drafting is the field—now bigger than ever before. And countless thousands of draftsmen and designers must come first—before any new production or construction can begin. Get into Drafting now!

You Get Experience While You Learn

I will train you at home in your spare time and give you actual experience on actual work—the same kind of jobs you will do for the best paying firms later on. You will be trained until you are competent, experienced, and are actually holding a position that will bring advancement and pay raises as deserved.

And what's more, I will give your experience as a reference to employers when you become competent. Lack of previous experience or higher education should not hold you back.

ACT NOW!

Delay gets you nothing. Mail the coupon today and get all the details and see what drafting can do for you. No obligation. No salesman will call. Give age to insure reply.

Tools and Other Equipment Sent When You Start!

Professional instruments, drawing table and other tools included and sent to you when you start. Nothing for you to buy.

Be A Draftsman . . . Always First in Every Kind of Production

Draftsmen rank top because drafting is such important work. Before anything can be made or built from common gadgets to locomotives, the draftsman's work comes first. His pay is big—his working conditions are the best.

Mail Coupon for VITAL FACTS!

Engineer Dobe, Div. 29, Libertyville, Ill.
Send me the Vital Facts on Drafting and Industrial Designing, your FREE BOOK and advertised list of positions for Draftsmen and Designers wanted.

Name.....Age.....

Address.....

City.....Zone.....State....

Copyrighted material

Install your own

PRIVATE
Telephone System

With these self-contained magneto ringing phones.

Stock No. B-588P
Price per unit complete with handset
$12.95
f.o.b. Dayton, Ohio.

- No external power is required - installation is simple, requiring only two wires or one wire and ground - and you can use as many units as you need on one pair of wires.
- You'll find them useful and time saving on the farm, on construction projects, on broadcast remotes, in your business, and wherever you need communication. They work and ring up to 50 miles.
- These telephones are not toys. They are Army surplus - slightly used, checked and inspected. Guaranteed to be in excellent condition. Dimensions: $5\frac{1}{4}$" x $6\frac{1}{4}$" x $9\frac{1}{2}$". Shipping weight 16 lbs.

SREPCO
STANDARD RADIO & ELECTRONIC PRODUCTS CO.
135 E. SECOND ST DAYTON 2, OHIO.

BE YOUR OWN BOSS!
LEARN ELECTROPLATING
HIGHLY PAID FIELD

UNCROWDED, interesting business. Part or full time. Common school education sufficient. Chromium, Nickel, Silver, Gold, etc., money making secrets. Processes. (Approved for Veterans.) *Send postcard today, **FREE** electroplating booklet and proof.*

PLATER HYDE
432 F Street Room 522
San Diego 1, California

PRESS YOUR OWN
PANTS • TIES • LAPELS

SAVE TIME AND MONEY. Plug in AC or DC socket and you're ready to go—no wet cloth, no board, no bother. Two nickel-plated pressing sides do the job. Use at home, office, when traveling. Women like it for skirts, slacks. A fine gift. Free circular, Empire Products, Inc., 817 Main St., Dept. PS., Cincinnati 2, Ohio.

Presser opens with a flick of the thumb.

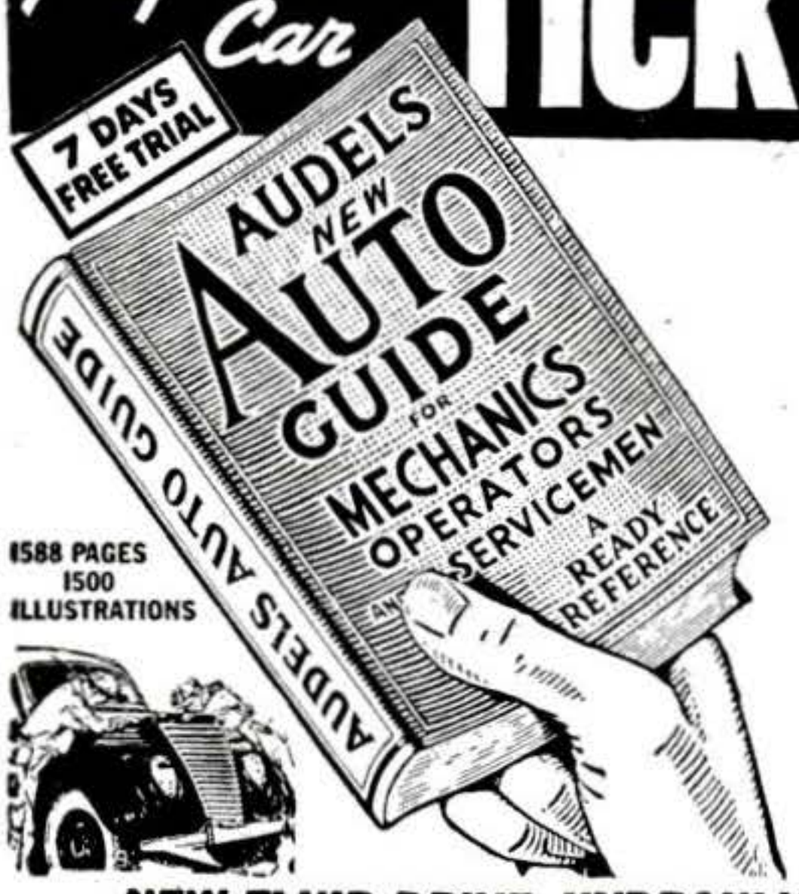
QUICK! EASY!

$2.49 at stores or send check or money order. C.O.D. accepted. Satisfaction Guaranteed.

Empire PRESSER

Keep that Car **"TICKING"**

7 DAYS FREE TRIAL



1588 PAGES
1500 ILLUSTRATIONS

Every operator and mechanic needs AUDELS AUTO GUIDE.

This book saves time, money and worry. Highly endorsed. It presents the whole subject of auto mechanics:

1—Basic principles
2—Construction
3—Operation
4—Service
5—Repair

Handy Size. Easily understood.

NEW FLUID DRIVE, HYDRAULIC SHIFT AND DIESEL ENGINES FULLY COVERED

Over 1500 pages—1540 illustrations showing inside views of modern cars, trucks and buses with instructions for all service jobs.

$4 **ASK TO SEE IT!—To Get This Assistance for Yourself Simply Fill in and Mail Coupon Today.**

COMPLETE • PAY ONLY $1. A MONTH ←

AUDEL, Publishers, 49 West 23rd St., New York
MAIL AUDELS NEW AUTO GUIDE for free examination. If O.K. I will send you $1 in 7 days; then remit $1 monthly until price of $4 is paid. Otherwise I will return it.

Name _____

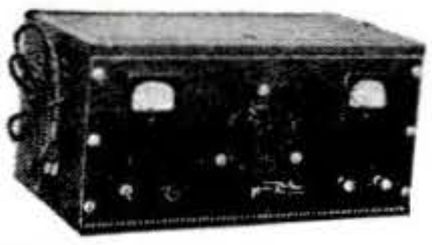
Address _____

Occupation _____

Employed by _____ P.S.M.

Have Your Own **ELECTRO-PLATING Business**

Profitable-Simple-Pleasant



The **VARI-PLATER**—110 V. A.C.—plus a glass or rubber tank and chemicals, which are always available, and accompanying handbook, that is illustrated and easy to understand, will give you many money making opportunities.

You can **PLATE** Gold—Silver—Chromium—Nickel—Copper—Cadmium, etc. on metals and non-metals with the **VARI-PLATER.**

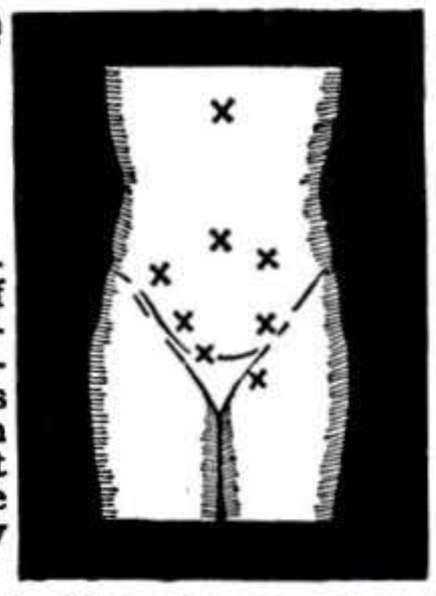
FREE **Write today for descriptive literature and price list.**

LEWIS ELECTRICAL MFG. CO. 1266-B GunHill Rd. New York 67, N. Y.

CANVAS COVERS **Waterproof tarpaulins,** war surplus (Used), perfect condition. Originally made for tents. Approx. 5'x8'. Two buttoned together make approx. 80 sq. ft. Complete with buttons attached. Suitable for use as canvas dams, hay covers, truck covers, machinery and equipment covers, etc. Packed in bales 40 each, priced 40 covers, **$1.00** ea; 15 covers, **$1.50** ea. Less than 15, **$1.75** ea. All FOB, Kansas City.

AMERICAN SUPPLY CO.
329 W. 5th Dept. P. S. Kansas City, Mo.

Is Your Rupture HERE?



Why continue to suffer with an uncomfortable truss if we can help you? Relief GUARANTEED or it costs you nothing. Send for the facts about my perfected truss invention—the Brooks Appliance for reducible rupture—with the patented AIR-CUSHION support that works silently with **Nature** to give protection. Thousands bought by doctors.

Sent on Trial—Made-to-measure, individual fitting for man, woman or child. Low-priced, sanitary, durable. No obnoxious springs or hard pads; no metal girdle to rust. Light weight, neat and comfortable. Not sold through stores or agents—beware of imitations. Write today for full information sent free in plain sealed envelope.

BROOKS APPLIANCE CO. 163 State St. Marshall, Mich.

Copyrighted material

POWERFUL WAR-TESTED

PUTT-PUTT

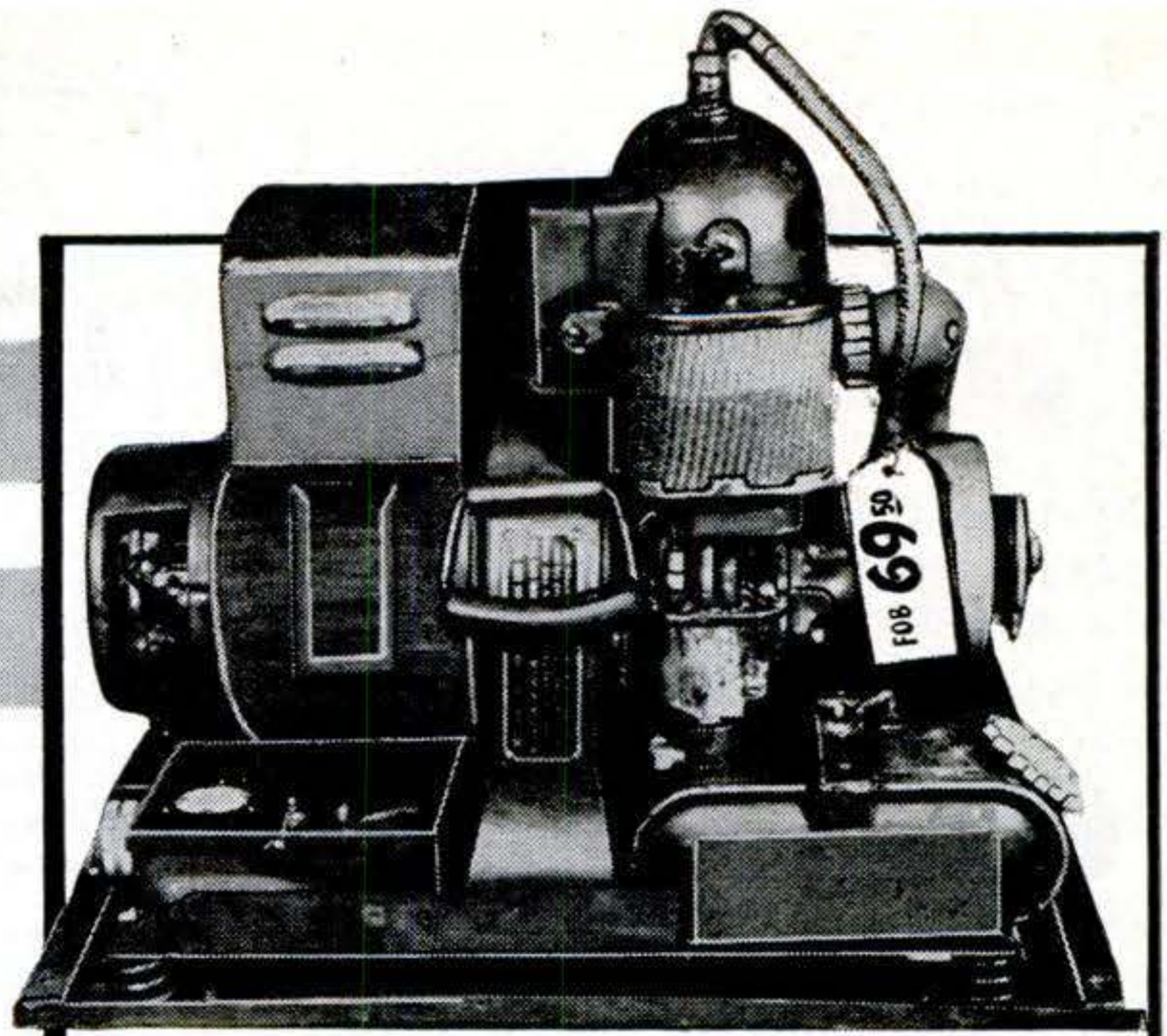
GIVES YOU APPROX. 4 H.P.

GASOLINE MOTOR

plus 24-28 volt 70 amp 2000 watt

D. C. GENERATOR

For only $69.50 complete



Here's one of the most useful items to come out of war surplus! Known throughout the Air Corps as the Putt-Putt, it's a combination gasoline motor-generator that packs a wallop as a universal power-source and generator of DC current. Each unit is slightly used, in excellent condition and guaranteed operative. Substantially crated for domestic shipment, they arrive complete, ready to operate. Generator is removed by detaching only 4 bolts. Cost to govt.: several hundred dollars. Cost to you: $69.50. *Order now.* Save C.O.D. charges by remitting in full—or send 25% deposit (bal. C.O.D.)

SPECIFICATIONS

- Govt. designated HRU-28, Commercial C-10A
- Removable generator (reduces weight by half)
- ¾" power-take-off shaft (2½" extension)
- 1 cyl.-2 cycle gasoline motor
- Total weight—115 lbs.
- Height—21½"
- Width—17½"
- Length—24⅝"
- Voltage regulator—12 to 35 volts

USES:

- Amateur Radio power supply
- Battery Charging
- Power source for war-surplus radio equipment (24v.)
- Powering farm equipment
- Starting airplane engines
- Generator for boat or farm (auxiliary) lighting
- Powering mowers & buzz saws
- Welders

R & M RADIO COMPANY

DEPT. S-11, 1426 N. QUINCY ST., ARLINGTON, VIRGINIA

BIG MONEY and YOUR OWN BUSINESS in LIQUID IVORY

FREE INFORMATION ON A GREAT NEW MONEY MAKING OPPORTUNITY

SEND FOR FREE DETAILS

Regardless of your age, sex, previous experience, we will send you astonishing free facts about the great possibilities—in your own business—with amazing LIQUID REPLICA IVORY. To secure this information, absolutely free, fill in coupon below or send a letter or postcard. No salesman will call on you now or ever. Write TODAY! Offer limited!

LIQUID IVORY is one of the most marvelous synthetics developed in years. With it you can easily and simply produce a wide variety of wonderful items that almost defy detection from genuine ivory. No expensive equipment is needed. You can work in a corner of your basement or garage with a few hours of work producing handsome profits. Here is unexcelled opportunity for all ambitious people that want a profitable business of their own.

A MONEY-MAKING BUSINESS FOR THE LITTLE MAN! NO EXTENSIVE CAPITAL NEEDED!

Forget big investment worries. We tell you how to get your own fast-moving business going with very little money. We feature only one sound business course. You will never find us confusing this successful vocation with other diverting business ideas. We tell you all about one great business and how you can make money in it exclusively. Write for full FREE information today!

GREAT OPPORTUNITIES NOW!

Stop being a slave to a time clock! Stop worrying about lay-offs and depressions stealing your livelihood. NOW is the time to line up your own money-making business. We offer this great opportunity to aggressive people. Get into your own profitable business with LIQUID IVORY. Get the FREE FACTS today!

Copyright—1947

EMPIRE TRADES and HANDICRAFTS

Box 1340 PS-11 St. Louis, Mo.

FREE INFORMATION COUPON

EMPIRE TRADES & HANDICRAFTS, BOX 1340-PS-11 ST. LOUIS, MO.

Please send me free details about your BIG money making LIQUID IVORY. I am anxious to get started in a profitable business of my own. Please rush!

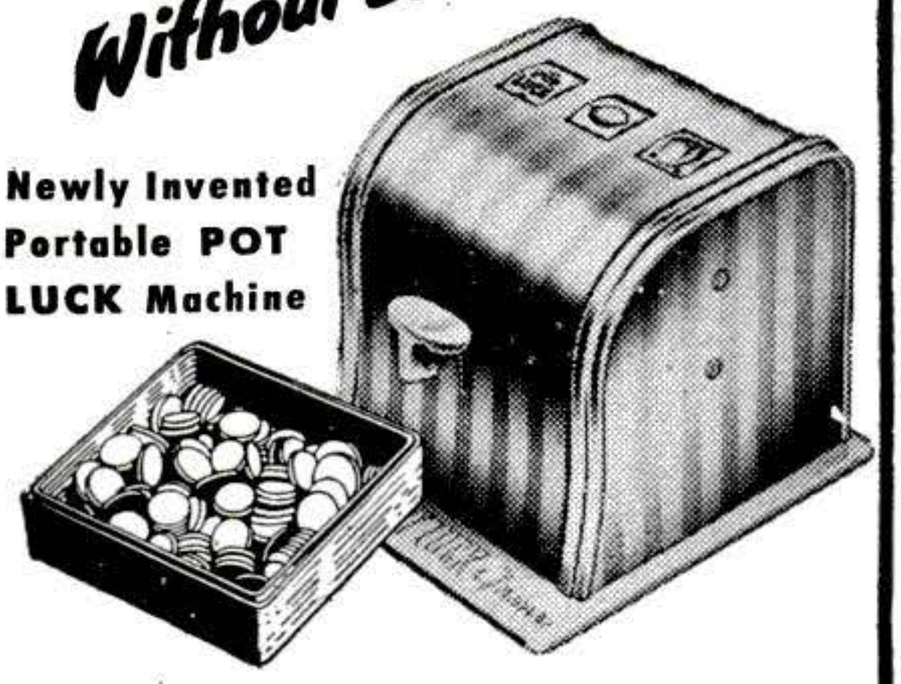
Name.....

Address.....

City.....State.....

Copyrighted material

Get Thrills of Gambling Without Losing Money!



Newly Invented Portable POT LUCK Machine

FUN TO HIT THE JACKPOT

Have all the thrills of winning with "Pot-Luck" . . the familiar symbols of cherries, bells and lemons turn up by just pushing plunger. You can play for hours. It's fun! Wonderful for parties, games, etc. Hit the "jackpot" and gather in your chips.

Sent to you complete with chips and instructions. Durably made of heavy pressed steel. Take it wth you on trips or use it at parties for amazing enjoyment. Guaranteed to please or REFUND OF PURCHASE PRICE IN 5 DAYS.

SEND NO MONEY — RUSH COUPON

FIFTH AVE. MDSE. MART, Dept. PL31
150 Nassau St., New York 7, N. Y.
Send complete "POT-LUCK" outfit by return mail. It is understood if I am not delighted after 5 days, I may return for full refund of purchase price.
( ) Send C.O.D. I will pay $2.98 plus postage.
( ) Enclosed find $3.00 in full payment.
( ) Send 2, special price $5.50 plus postage.

Name.....
Address.....
City.....Zone.....State.....

AUXILIARY POWER PLANTS

Govt cost $300. our Price $40.
Description available. No C.O.D.
NEW YORK OUTLET & SALES CORP. 144 Chambers St. N.Y. 7 N.Y.

ELECTRIC LIGHT JAZZ BOW TIE!

Astonish, amaze your friends. Be the life of the party. Have lots of fun. Easily put on. Flashes on and off by simply pressing battery button hidden in your pocket. Complete with attractive bow tie, cord, two bulbs and battery. Mail your order today.

$1.95

New Scientific "GUZZLIN CHARLIE"

MYSTERY DRINKING BIRD WITH ROLY POLY EYES

$1.95 Complete with stand. No springs, no gadgets, no wires, not mechanical. Amazing "Guzzlin Charlie" drinks and drinks; he is always thirsty. You won't believe your eyes. Young and old go wild over him.

Two Unique Xmas gifts. Mail your order today. Special prices on all articles to dealers.

BERNARD FINE CO., INC.
501 Sixth Ave. Dept. PS6 New York 11, New York

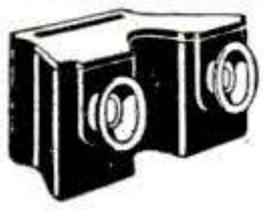
FOR STEREO PICTURES, IT'S

STEREO-TACH!

Take Third Dimension Pictures with the STEREO-TACH and your own camera!

There's nothing in photography so startlingly beautiful and lifelike! You *can't* reproduce a *3-dimension picture* in flat 2-dimension printing!

Outfit No. 101—'Tach and Transparency Viewer (for transparencies, with 35MM cameras) **$22.50***



Transparency Viewer

Outfit No. 100—'Tach and Print Viewer (for stereo prints, with both 35MM and other size cameras) *Plus Tax. **$16.25***

The Stereo-Tach

For Third-Dimension Projection, the STEREO-FLECTOR! Just Out! *See your dealer or write.*

ADVERTISING DISPLAYS, INC. Dept. PS-9 COVINGTON, KENTUCKY

Now CHEAP OIL BURNER

FOR HEATING AND COOKING STOVES - FURNACES

HEAT YOUR HOME, COOK YOUR MEALS WITH CHEAP FURNACE OIL

NO MORE SHOVELING COAL OR ASHES. Sensational Fuelizer Starter Vaporizing System turns Cheap No. 1 Furnace Oil, also Range, Heater, Tractor Distillate, Kerosene and like oils into oil heat—one of the quickest, hottest fires known. LIFETIME GUARANTEE. **$1.00 Bonus Offer for Testing.** We will let you try it in your own stove or furnace for one month. Get yours for introducing. Big profits QUICK. Be first. Send in your name today for details and cash in on the tremendous demand for this Amazing Invention.

NORTHWEST MFG. CO. 606-N, Mitchell, S. Dak.

ART STUDENTS

BEAUTIFUL HOLLYWOOD MODELS

Art Films Suitable for Study of Effective Lighting & Composition

50' 8mm...**$1.25** 100' 16mm...**$ 5.00**
200' 8mm... **5.00** 400' 16mm... **10.00**
Send NO MONEY, We Ship C.O.D.

EIGHT SIXTEEN FILMS, INC.
630 Ninth Avenue New York 19, N. Y.

ATOMS IN ACTION!

For few cents, in few hours make and operate atomic energy devices. All absolutely harmless. Easily made, intensely fascinating. *Flash chamber.* You see vivid, frenzied flashes caused by released atomic energy. Instructions 50c. *Electroscope.* Test minerals, rocks, earth, etc., for atomic activity. Instructions 50c. *Wilson Chamber.* Phenomenal display of ionized particles in violent action. Instructions 50c. Easily understood scientific explanations. All three above with captivating booklet "Essential Atomic Theory" and list of easily obtainable material, $1.00, complete.
ALPHA-ATOM PRODUCTS CO., Dept. A, 475 Fifth Avenue, N. Y. 17, N. Y.

LEARN TO DRIVE

NEW - MODERN - COMPLETE
Profusely illustrated course in driving an automobile; approved by driving schools. Only a **$1.00** to:
A. Szafarz, P. O. Box 705, Pawtucket, R. I.

DON'T PULL HAIR FROM NOSE

May Cause Fatal Infection

Use the Hollis* KLIPETTE *Rotating Scissors
REG U.S. PAT. OFF.

You can cause serious infection by pulling hair from nose. Ordinary scissors are also dangerous and impracticable. No better way to remove hair from nose and ears than with KLIPETTE. Smooth, gentle, safe, efficient. Rounded points can't cut or prick skin.

So Simple! Just turn the end. Surplus hair clipped off gently, safely.

$1 Made from fine Surgical Steel, Chromium plated—also in 24 Kt. Gold Plate in smart leather case at $3.50 (plus 70c Fed. Tax)

Guaranteed to Satisfy or Money Back

HOLLIS CO. • 11 Commerce St., Newark 2, N. J. • Dept. 9-B
Enclosed is $.....for.....KLIPETTE(S) at $1 (no tax); .....in gold plate at $3.50 (plus 70c Federal Tax). If not satisfied, I may return the above for refund in 10 days.

Name.....Address.....

Copyrighted material

Young Man! Now You're Out of School . . .
YOU WANT TO GET AHEAD—MAKE MONEY

Choose from these 5 Trades

They Offer High Pay — Lifetime Work — Security

AUTOMOTIVE & TRACTOR Covers all phases of mechanical training, tune-up service, trouble shooting, repair, latest types model motors used for projects. **34 WEEKS.**

DRAFTING Elements and technique, drafting geometry, construction plans and specifications, auxiliary elevations, every phase. **32 WEEKS.**

PLUMBING Every step, from pipe cutting and threading, lead work, home and industrial installations, worked out in our own plumbing shop. **34 WEEKS.**

ELECTRICITY Basic principles, magnetism, current electricity, residential and industrial wiring, appliance repair. **34 WEEKS.**

SHOE REPAIR From simplest repairs on boots and shoes to the finest details of reconditioning and rebuilding, under expert craftsmen. **39 WEEKS.**

"There's an Endless Demand for the Man Who Knows"

For YOUR lifetime career, learn one of these interesting and well-paid trades NOW. Be trained FOR the job, not ON it. All courses under especially trained instructors with practical experience. 6 hour Classes 5 Days a Week. Our Employment Department helps you

VETERANS — If you qualify for any of these finer trade courses, your tuition and subsistence is paid by your government! Limited Enrollments. Don't miss this Opportunity!

Mail Today!

National Trade School, Dept. C 2610 Grand Ave., Kansas City 6, Mo.

Without obligation to me please send full information on the courses checked.

..... Automotive and Tractor Technician ..... Drafting
..... Plumbing ..... Electricity ..... Shoe Repairing

Name ..... Age .....

Address .....

City ..... State .....

Veteran? .....

ADD TO YOUR INCOME

Profit by Increasing Demand for Belts, Purses, Gloves Woolskin Toys —

with LARSON Leathercraft

No Experience Necessary

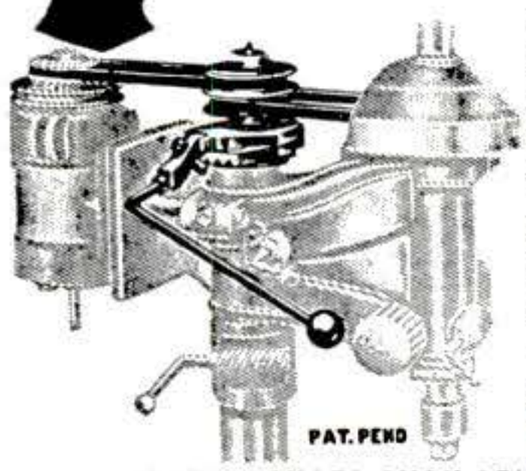
Sell popular, useful, easy-to-assemble items from Leathercraft Headquarters. Complete stock. All tools and accessories. Instructions come with materials. Immediate delivery.

101 Ideas

Send ten cents at once for catalog of money-making ideas.

For new, 16-page catalog, write to J. C LARSON COMPANY
178 N Wacker Dr., Chicago 6, Ill.

VARIABLE SPEED ATTACHMENT



Era Variable Speed Drive enables the operator to provide correct speed for large or small drills by a convenient, quick method of shifting a lever. Speeds are changed while motor is running.

Furnished as a complete unit, including belts. When ordering, be sure to specify make and model of drill press, also type of pulley bearing desired.

Designed to fit all popular makes of drill presses, can be installed in a few minutes without drilling of holes.

SPEED RANGES AVAILABLE WITH STANDARD DRIVES

	Min./Max.
Atlas 53, Sears 101.035	310/10,000
Atlas 63, Sears 101.036	310/10,000
Boice Crane 1600	260/10,000
Buffalo 15	290/ 9,800
Canedy-Otto 16 Royal	390/ 9,700
Delta 14 L. Speed	310/ 3,900
Delta 14 H. Speed	580/ 5,300
Duro 14, M. Ward H. Duty	350/ 9,000
Walker Turner 900 L.S.	360/ 3,100
Walker Turner 900 H.S.	670/ 5,500

Price Any Above { Light Duty Mod. **$27.50**; Bronze Bear. Mod. **$34.00**; Ball Bearing Mod. **$40.00**

	Min./Max.
Buffalo 18	250/ 4,600
Delta 14 L.S. Press	235/ 3,850
Delta 14 H.S. Press	350/ 9,000
Delta 17 L.S. Old Mod.	300/ 2,850
Delta 17 H.S.	600/ 5,500
Delta 17 L.S. New Mod.	215/ 4,300
Delta 17 H.S. New Mod.	430/ 8,300
Walker Turner D-1100 L.S.	160/ 3,900
Walker Turner D-1100 H.S.	236/ 5,000

Price Any Above { Bronze Bearing Mod. **$39.00**; Ball Bearing Mod. **$45.00**

Shipped Complete Including Belts **Prices F.O.B. Factory** **No C.O.D.**

ERA METER CO.
3938 NORTH KILPATRICK AVENUE, CHICAGO 41, ILL.

Independence

EVEN WEALTH, WITHIN EASY GRASP

Make & Sell CHEM-STONE — Hardens Concrete Surfaces

Every one of the thousands of concrete floors represents a prospect for dustproofing with Chem-Stone. You can be in business in a week! Ask about our 15 Private Manufacturing Processes — Chem-Stone's just one!

We tell you ALL—How to Make—Where to Buy simple inexpensive materials—How to Package. Promote. Sell. If you are SINCERE. if you can follow simple directions, here are 15 Roads to Success.

These are factory-tested processes. Big businesses have been built on them. There's still room for you. The public WANTS the products. You, yes you, can **Make & Sell** them. Lose no time! Write for details.

CHEMICAL RESEARCH CO. 214 West 42nd Street, New York 18, N.Y

Copyrighted material

Santa Rides Again!

SEND FOR THIS NEW

FREE

SUPPLEMENT & GIFT GUIDE

SUPER VALUES FOR YOUR LIST—FOR YOURSELF

- ★ save money!—new low-cost offerings in P. A., "ham" equipment and wanted radio parts.
- ★ miracle Lafayette FM tuner, sensational buy!
- ★ rich console radio with automatic record player, under $100.
- ★ selection of small home electrical appliances.

. . . and lots more.

Lafayette Radio

RADIO WIRE TELEVISION, INC.

100 Sixth Ave., N. Y. 13 • 542 E. Fordham Rd., Bronx 58
110 Federal St., Boston 10 • 24 Central Ave., Newark 2, N. J.

LAFAYETTE RADIO, Dept. LK7
100 Sixth Ave., New York 13, N. Y.
Rush new Supplement & Gift Guide #88S.

Name.....

Address.....

City.....Zone.....State.....

Men's Fully Guaranteed NEW $13.95 PLUS TAX

15-JEWEL WRIST WATCH

ORIGINALLY sold up to $55

Sacrificed because they're post-war surplus

LOOK AT THESE FEATURES:

Luminous dial . . . sweep second hand . . . waterproof . . . shockproof . . . anti-magnetic . . . imported Swiss precision movement and case.

You get them now for a small fraction of original prices. Don't delay! Order now . . . while they last. **Send only $1** down payment with order. Pay balance to postman on arrival, plus postage. Or we pay postage if you enclose $13.95 plus $1.39 Fed. Tax.

Receive Reg. $2 expansion band FREE with prepaid order. Money back in 5 days if not delighted. Order now.

MARYLAND DISTRIBUTORS, Dept. S-2
501 E. Balto. St. Balto. 2, Md.

AMPLIFIER

For Call System or Phono. Amplifier

Compact-Wired Ready to operate. Uses 35Z5-50L6 **$1.95**

25% Deposit Required

SINGER RADIO & TELEVISION
553 Market St., Dept. C, Newark 5, N. J.

JEWELRY FINDINGS

IMITATION PRECIOUS and SEMI-PRECIOUS
STONES ORNAMENTS CHAINS

We have in stock a most complete supply of PLASTIC and METAL FINDINGS. A selection of specialized varieties of beautiful colors in—CAMEOS, PINBACKS, CHAINS, STONES, BEADS, FLOWERS, CROSSES, JUMP RINGS, SPRING RINGS, CLASPS, etc. Make big profits in costume jewelry Designing, Fabricating, Novelties etc. Send for our up to the minute complete illustrated catalogue and price list. Full refund with the purchase of your first order. Send for your copy, NOW ONLY 10c

PICKWICK FINDINGS COMPANY
Post Office Box 780A Stamford, Connecticut

make your own *Gems* 29.50 F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only $29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. M — Burlington, Wis.

MAKE $ MORE MONEY

Applying or Selling

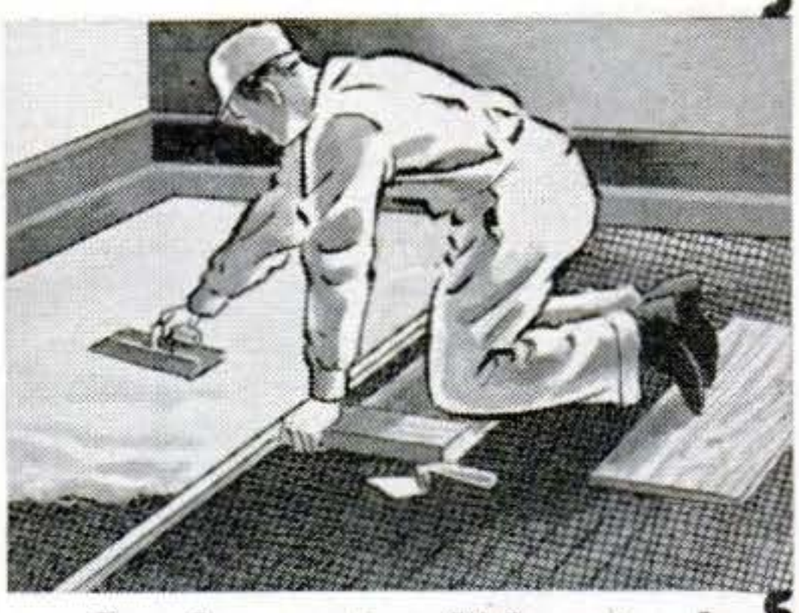
CORKSTONE

A General Purpose Magnesium Oxychloride Flooring

THE MODERN PLASTIC FLOORING

EASY TO APPLY

Here's your opportunity to get into business for yourself applying or selling Corkstone, the economical, top-grade plastic flooring. Plenty of profit. Act without delay!



Dealers & Agents Wanted

WRITE FOR DETAILS

LASTING PRODUCTS COMPANY
200 Block S. Franklintown Rd., Baltimore 23, Md.

EARN BIG MONEY BE AN ARTIST

Now you can really teach yourself to be an artist with the help of one of the leading art directors.

Special simplified quick course, showing all the short cuts to becoming a big time artist. Learn to draw and paint for magazines, advertisements, etc

10 complete lessons, including actual artists' sketches and example drawings on real art board—figure drawings from live models, art poses, anatomy, cartoons, caricatures and many others.

OVER 200 ILLUSTRATIONS

Extra! For Prompt Action

5 COMPLETE ART BOOKS
ON ALL SUBJECTS OF ART
EVERYTHING POSTPAID

MONEY BACK GUARANTEE! Fill out coupon, enclose in envelope with TWO DOLLARS cash or money order and mail to

HOLLYWOOD ARTISTS
P. O. Box 2344, Los Angeles 53, Calif.

NAME.....

ADDRESS.....

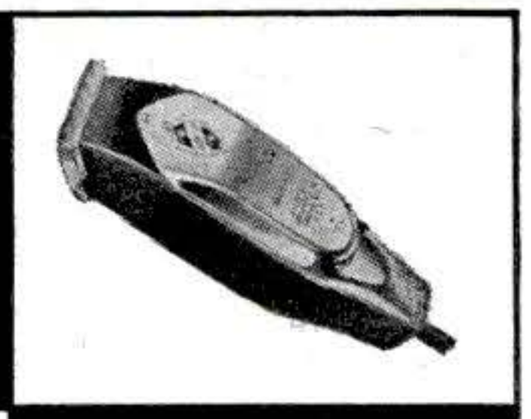
CITY.....STATE.....

COMPLETE COURSE POSTPAID $2.00

Copyrighted material

New! . . .

MONEY-SAVING HOME CLIPPER FOR ALL THE FAMILY



Save big money on your family haircuts. This new, electric home clip pays for itself in 15 haircuts! Easy to use! Safely trims legs and under-arms with razor closeness. Guaranteed. Will last a lifetime. Only $12.75.

Ask your dealer or write direct to

BELLE CITY APPLIANCE CO.

Department S

RACINE, WISCONSIN

The American Institute of Specialized Watch Repair
270-276 East Building GRAND RAPIDS 6, MICHIGAN
A Fully Accredited School

You can learn this highly fascinating and profitable trade through this Institute, either at home by correspondence . . . or at the resident school.
Earn While You Learn

Write for Free Circular

Learn
WATCH REPAIRING

NOW READY! Floyd Clymer's Newest and Best Motor Scrapbook of Historical Cars . . No 4.

Illustrates, describes 200 early cars, motorcycles. Entirely different from books 1, 2, 3 (also available). $1.50 each postpaid; $2.50 for De Luxe edition.

CLYMER, Dept B-11, 2125 W. Pico, Los Angeles 6, Calif.

ELECTRIC WELDER

AC or DC 110 Volts

Pre-war type—All metal—No chemical—5 year written guarantee. Welds 1/8" thick metal or money back. Repairs tanks, tools, fenders, machine parts, etc. Comes complete with rods, unit directions and eye shield. We also manufacture a set you can learn with for only $3.95 complete. On C.O.D. mailing charges extra.

$6.45 Complete

ESSAY MFG. CO., INC., Dept. P.S., Quincy 69, Mass.

BUILDING CONSTRUCTION

with composition cement and cheap wood builds good 3-room house for $250; barns low as $50.00. 100 illustrations and 100 money and labor saving suggestions. Get this newly revised and enlarged, guaranteed book before you build. **$1.00**, postpaid.

SHEET METAL COTTAGES and other buildings. Several new methods. Illustrated instructions, **50c.**

FURNITURE OF COMPOSITION. Cement, sawdust, asbestos, etc., **50c.**

SHOP MACHINES FROM OLD AUTO PARTS: Over 60 described, **50c.**

60 selected ways to earn up to $20.00 a day, **25c.**

HOME MFG. ENTERPRISE. 50 home shop projects. Ills., **50c.**

Special: All six booklets described above, $2.00 postpaid.

HOME INDUSTRIES, 1318 So. 30th Ave., Dept. PS, Omaha 5, Nebr.

RADIO—FM TELEVISION

Lucrative positions open to technical specialists. WRCI graduates employed as Broadcast Operator-Engineers, Airline Flight & Ship Radio Officers, CAA & Police Radio Operators, Radio Shop Owners, Radio-Television Technicians. **Modern equipment**—uncrowded facilities. New classes monthly. Free bulletin. Approved for veterans. Member, Los Angeles Chamber of Commerce.

WESTERN RADIO COMMUNICATIONS INSTITUTE
631 W. Ninth St. Dept. PS Los Angeles 15, Calif.

BE A ***TOP-WAGE***

AUTO MECHANIC ***NOW!***

Or learn how to earn HIGH PAY in Auto Body and Fender Repairing! Refrigeration, Air Conditioning and Electrical Appliances can also be YOUR TRADES. Any skilled workman will tell you that men in the **auto** and **household** trades have the best of it—a steady, profitable business every month of the year!

Taught by ACTUAL EXPERIENCE with modern equipment in repair shops established 25 years; thousands of successful graduates; many now employ recent graduates. One graduate foreman employed 8 graduates last year. One graduate with physical disability made almost $6,000 as repairman in 1 year. These facts testify why 25 years' training and placing men in industry qualified us as the school for **YOU. We assist you to find part-time jobs while attending school.**

OPENINGS NOW. WRITE TODAY!

STEVINSON AUTOMOTIVE SCHOOL
2008 Main Street (PSM) Kansas City, Mo.

Let Them Work for YOU as They Have for These Successful Men!

Quick, Ready, Low Cost Help *for* BETTER JOBS!

Sent C.O.D. Anywhere in U. S. Money Back if Not Satisfied

MAIL COUPON

MAKE MONEY Doing Work You Will Like

SAVE MONEY On Your Home Improvements

To help you on your job — to get a better job — to save money on your own home repairs and improvements — get a low cost, practical Drake Book. Fortieth year of publication and always up to date. Recommended by thousands of users and sold under a strict money-back guarantee. All books are standard library binding—not pamphlets or cheap paper covers. Order on coupon now.

Select From This List

Circle Numbers of Books Wanted on Coupon Below

PLUMBING • Installation and Repair
Expert instruction enables inexperienced to plan and install simple plumbing and hot water systems according to good practice without violation of general regulations. 162 illustrations. 256 pages. Book No. 1. $2.00

Heating • Cooling, Air Conditioning
Specially prepared for those with no experience. Covers computation, planning, selection of equipment, installation and operation. A real how-to-do-it book. 700 pages. 350 illustrations. Book No. 2. $4.00.

HOUSE WIRING MADE EASY
The ideal book for the home owner and handyman. Covers layout, plans and complete installation. Simplified for quick understanding and easy use. Over 100 illustrations. Book No. 3. $1.50

PAINTING AND DECORATING
A book for professional painters and home owners. Covers methods, tools and materials for every branch of painting and decorating. No matter what kind of job you want to do it is in this book. 350 pages. 288 illustrations. Book No. 4. $3.50

CARPENTRY • Practical Procedure
A most practical and usable book that will give you a working knowledge on all building details. Expert's best methods for measuring, cutting, fitting, all materials. 300 pages. 700 illustrations. Book No. 5. $2.50

ROOF FRAMING — Brand New
Written from a lifetime of practical experience by outstanding authority. Covers every type and phase of roof framing. 175 pages. 400 illustrations. Book No. 6. $2.00

REFRIGERATION SERVICE MANUAL
Covers all types of household and commercial refrigeration with latest information on maintenance, trouble shooting and repair. Millions of refrigerators must be serviced. Make money with this book. 300 pages. Illustrated. Book No. 7. $2.00

AUTOMOBILE ENGINE MANUAL
Just the book to keep your own car going or for making money on repair and tune-up jobs for others. 300 pages of vital information. 200 illustrations. Book No. 8. $3.00

Send No Money

MAIL COUPON NOW

Frederick J. Drake & Co., Dept. 58
600 W. VanBuren St., Chicago 7, Ill.

Send me the books checked below. If not satisfied I will return them in 5 days and money will be refunded.

1 2 3 4 5 6 7 8 (Circle Numbers Wanted)

☐ Check or Money Order enclosed $.....Send books postpaid.
☐ Send C.O.D. plus postage.

Name.....

Address.....

City.....State.....

Drake's Books are Sold by Leading Booksellers

Copyrighted material

NOW Install your own LOW COST 2-WAY TELEPHONE

Talk from house to barn, warehouse . . . . . office to shop, etc.

Easy to use! Just hook up terminals to any 2-strand wire; several phones on same line if desired. Operates on standard flashlight batteries. Compact, rugged . . . portable. Performance equals best present day commercial telephones . . . GOOD UP TO 17 MILES!

GENUINE ARMY FIELD TELEPHONES

BATTLEFIELD PROVEN!

NEW - per pair, complete with heavy canvas case . . . **$29.50**; leather **$32.50.**
USED - per pair complete with either case .. **$19.50**

Extra wire, new 500 ft. $3.50. 1/2 mile reel $10.50. 1-mile reel $16.00. FOB Sacramento. No COD

FREE With every order - 50 ft. sample new Army field wire.

Write for FREE Illustrated Catalog

MAKES IDEAL CHRISTMAS GIFT

SEND CHECK or MONEY ORDER LORIS SALES

P. O. Box 1896—Dept. A, Sacramento, California

WOULD you like to buy yourself a nice big chunk of financial security? You can by building a lucrative business of your own NOW with TRADIO, the radio functionally-designed for coin-operation in hotels, hospitals, motels, etc. All over the country, individuals like yourself are finding it a natural for big earnings and a steady income. TRADIO has pioneered in this new and flourishing postwar industry. Get in on the ground floor and assure yourself of financial security for life.

Phone, wire or write Dept. O-11 for complete information. No routes sold.

TRADIO, Inc. ASBURY PARK NEW JERSEY

WORLD'S SMALLEST RADIO KNOWN!

Wt. only ¼ lb. Beautiful Silver Black plastic case. Has Inductive Slide Tuner—W4 Crystal Diode—NO TUBES, BATTERIES OR ELECTRIC "PLUG IN" NEEDED!

GUARANTEED TO PLAY • NEW 1948 MODEL

on local stations if complete instructions sent are followed. Use it at home, in bed, in many offices, hotels, cabins—most anywhere! Hundreds of satisfied customers all over the world!

SEND ONLY $1.00 (Cash, M.O., Check) and pay postman $2.99 plus delivery fees on arrival or send $3.99 for Post Paid delivery. Complete as shown—ready to play with self contained personal phone . . . WONDERFUL GIFT FOR CHILDREN! Order now at this low bargain price.—Prompt shipment on orders sent now—today! Be first to get YOUR Pakette Radio! (All foreign orders $5.00 U.S. cash with order).

Pa-Kette Radio Co., Inc. Dept. PS-11 Kearney, Nebraska

STAINLESS STEEL **AIR TANK WITH 100 USES**

Ideal portable Air Tank to carry in car. Will completely inflate four tires from one filling.

Makes wonderful pressure tank for paint and insecticide spraying, too. Complete with air hose, air chuck, valve for filling, welded handle, and blue enamel finish.

Sold in U.S. only. No foreign orders accepted.

Non-corrosive, non-shatterable. Tank tested for 450 pound pressure. Volume, 2100 cu. in. Size 12½"x24".

$7.50 F.O.B. Kansas City

W. F. TEAGUE & COMPANY
714 CENTRAL, KANSAS CITY 6, KANSAS

SUPER-MITE RADIO $3.99

PACKS AMAZING POWER!

SUPER-MITE FEATURES!

- World's most powerful miniature radio.
- Uses War-Born midget electronic tubes.
- Covers broadcast band, fully portable.
- Coast-wide reception obtained.
- Powered by midget hearing-aid battery.
- Picture diagram for radio beginners.

Brilliant red chassis, chrome and black dial, streamlined bakelite knobs. Complete kit ready to wire as shown Only $3.99 Post Paid. Tubes 95c each. This high quality set not available elsewhere at 10 times this price!

ELECTRONIC RESEARCH
1216 Park Row Bldg. New York City 7

Learn MASONRY CARPENTRY

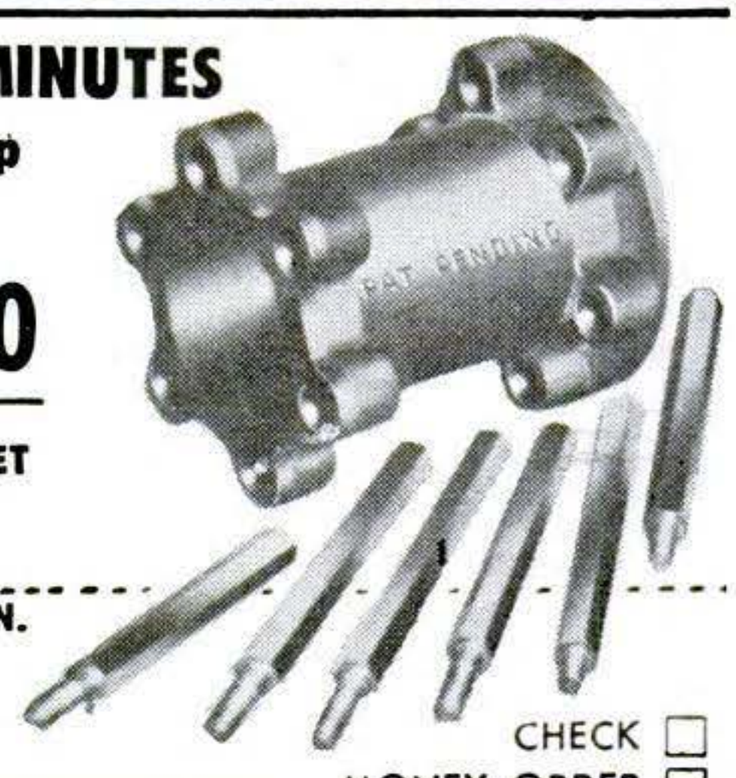
Write for "Free" Catalog

In a few short weeks you can be making big money in the building trades. Learn now while opportunities are greatest. Prepare for the future. You receive your training in our completely equipped shops under expert instructors. Fully approved for G.I. Training.

MIDWEST SCHOOL OF BUILDING TRADES
Dept. A-211 411 N. Center Street Bloomington, Ill.

INSTALL DUAL WHEELS IN LESS THAN 10 MINUTES

On your Trailer, Pick-up Truck, Farm Wagon or Jeep with STANDARD WHEELS



In less than ten minutes, at an amazing low cost, you can now convert your vehicle to dual wheels We've eliminated the expense of changing your wheels and hubs, or changing the entire axle. All you need is a rim wrench to *install dual wheels yourself.* DUAL WHEEL CONVERTERS are guaranteed to do the job or your money back At your equipment dealer or write to Northwestern Auto Parts Co., 834 N. 7th St., Minneapolis 11, Minn.

ONLY **$28.50** COMPLETE SET

MAIL COUPON TODAY FOR YOUR DUAL WHEEL CONVERTERS

NORTHWESTERN AUTO PARTS CO., 834 NO SEVENTH ST., MINNEAPOLIS 11, MINN.

Please send me_____Dual Wheel Converters at $28.50 each. 11

☐ FORD ☐ CHEV ☐ DODGE-PLYM ☐ JEEP

CHECK ☐
MONEY ORDER ☐

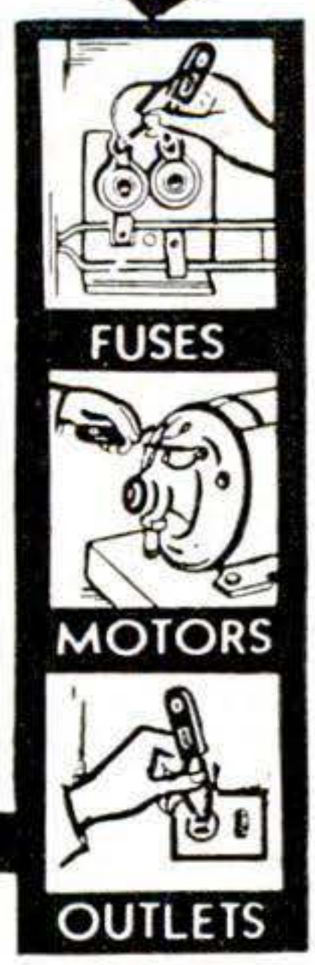
NAME_____ADDRESS_____

Copyrighted material

Test-O-Lite the MODERN TROUBLE SHOOTER

THE NEON GLOW

. . . LOCATES TROUBLE INSTANTLY in electric circuits, fuses, cut-outs, motors, radios, appliances. Tests everything electrical from 100 to 550 volts. Indicates hot or grounded wires. Tells AC from DC. Engineers prefer it because it has patented safety features.



PUTS "FINGER" ON THE TROUBLE SPOT - - QUICKLY

Far superior to ordinary clumsy test bulb. Saves precious time. Indispensable in shop or home. Vest pocket size. Lifetime guarantee. (Pat. No. 1,778,883) Purchase through regular electrical dealers.

L. S. BRACH MFG. CORP.
200 Central Ave. Newark, N. J.

MONEY for MEN ALL DATA FREE

THE PLASTEX industry needs manufacturers on small scale and for big production of Lamp and Clock Stands. Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. ½c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. Big chain store orders now being placed. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3408 Third Ave., New York 56, N. Y.

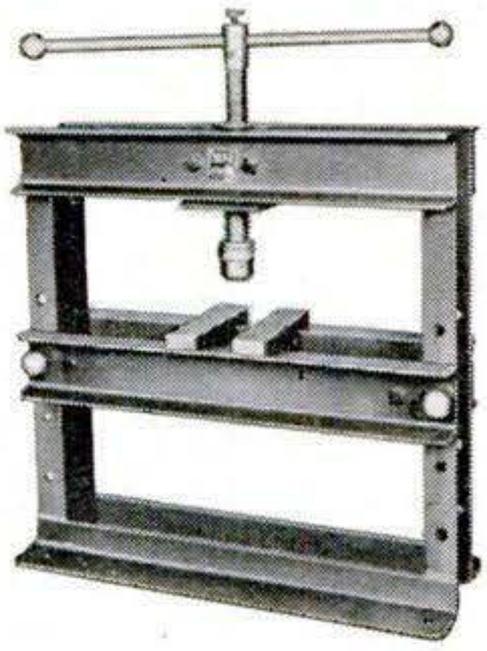
FREE—*Big illustrated broadside.* Shows 5′ Parachute Jump, other action models built with Erector. Gilbert Chemistry sets. Other Gilbert Scientific Toys. *Write to:*
A. C. Gilbert Co., 314 Erector Square, New Haven, Conn.

Say You Saw It In Popular Science

★★★ MACHINERY ★★★

LATHE—DRILL PRESS—SAW—Now Ready—Others On the Way—All Metal—All Machining Completed—Assemble Yourself and Save—Folder 947M on Above 10c, Refunded on First Order. Catalog 1046 on Tools—Aluminum—Plastics—Supplies—Equipment, etc. 15c.
Metiplas Supply Co., 1420 So. 16th Ave., Maywood, Ill.

A 10-Ton Press at Low Cost

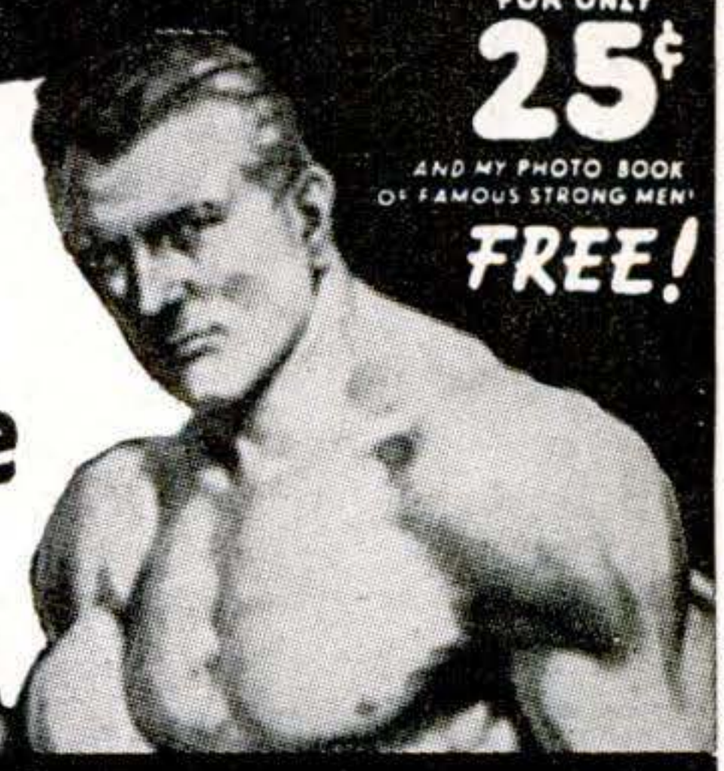


Pressing, separating, bending, and straightening jobs in your shop are easy with this press. Ten-ton capacity provides ample pressure. Adjustable table takes work up to 18 inches wide and 11½ inches high. Send for free bulletin showing press and wide variety of accessories.

UT-10A Press f.o.b. factory $28.25

DAKE ENGINE COMPANY
622 Seventh Street, Grand Haven, Michigan

NOW! ALL 5 FAMOUS JOWETT COURSES in 1 COMPLETE MUSCLE BUILDING VOLUME! FOR ONLY 25¢ AND MY PHOTO BOOK OF FAMOUS STRONG MEN FREE!



LET ME PROVE I can make YOU

COMMANDO-TOUGH

OR IT WON'T COST YOU A CENT!

says: *George F. Jowett* WORLD'S GREATEST BODY BUILDER

GIVE ME 10 MINUTES A DAY

Learn My Time Tested Secrets Of Strength

I'll teach you the "Progressive Power Method" through which I rebuilt myself from a physical wreck the doctors condemned to die at 15, to the holder of more strength records than any other living athlete or teacher! "Progressive Power" has proven its ability to build the strongest, handsomest men in the world. And I stand ready to show you on a money back basis—that no matter how flabby or puny you are I can do the same for you right in your own home. Let me prove I can add inches to your arms, broaden your shoulders, give you a man-sized chest, powerful legs and a Rock-like back—in fact, power pack your whole body so quickly it will amaze you! Through my proven secrets I bring to life new power in you inside and out, until YOU are fully satisfied you are the man you want to be.

PROVE IT TO YOURSELF IN ONE NIGHT

Send only 25c for my 5 easy-to-follow, picture-packed courses now in 1 complete volume "How to Become a Muscular He-Man." Try it for one night! Experience the thrilling strength that surges through your muscles.

10 DAY TRIAL!

Think of it—all five of these famous courses now in one picture-packed volume for only 25c. If you're not delighted with this famous muscle-building guide – if you don't actually FEEL results within ONE WEEK, send it back and your money will be promptly refunded!

PHOTO BOOK OF FAMOUS STRONG MEN!

I am making a drive for thousands of new friends fast —REGARDLESS OF COST!

SO GET NOW MY 5 Muscle Building COURSES
(Valued at $5 each)
All in 1 Great Complete Volume Packed With How-To-Do-It Pictures!

Now, this "get-acquainted," extremely low price of only 25c is your chance to build a body you'll be proud of! Follow Jowett's easy method of muscle building NOW!

For Only **25c**

FREE!

Photos that inspire you to might and muscle. Free with order.

George F. Jowett
Champion of Champions

FREE GIFT COUPON!

Jowett Institute of Physical Culture **Dept. P S-711**
230 Fifth Avenue, New York 1, N. Y.

George F. Jowett:—Please send by return mail, prepaid, FREE Jowett's Photo Book of Strong Men, along with all 5 Muscle Building Courses. **1.** Molding a Mighty Chest, **2.** Molding a Mighty Arm, **3.** Molding a Mighty Grip, **4.** Molding a Mighty Back, **5.** Molding Mighty Legs—Now all in One Volume "How to Become a Muscular He-Man." Enclosed find 25c. NO C.O.D.'S.

NAME. . . . . AGE. . . . .
(Please Print Plainly, Include Zone Number)

ADDRESS. . . . . .

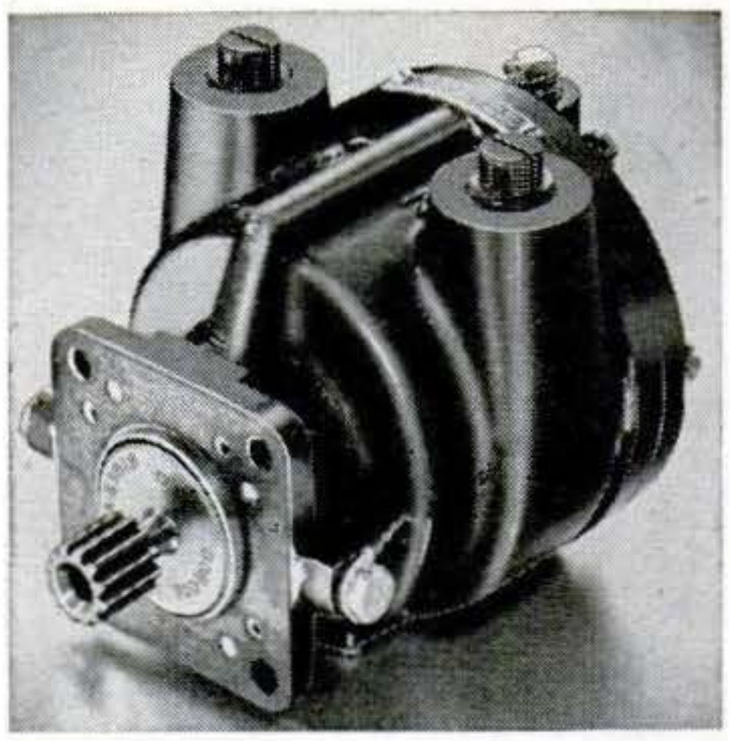
Copyrighted material

WAR SURPLUS BARGAIN SPECIAL

BRAND NEW!
VACUUM-AIR HYDRAULIC

FUEL PUMP

Original Cost $45.00
Now Only
$9.95
Postpaid in U.S.A.



WORTH MANY TIMES THIS LOW SALE PRICE

USE THEM FOR
OIL BURNERS
SPRAYING MACHINES
MILKING MACHINES
COMPRESSORS
VACUUM PUMPS
HYDRAULIC SYSTEMS
MANURE LOADERS
PRESSES, etc.

● Originally cost $45.00. Used by the Air Corps to drive bomber de-icer boots, gyroscopes, automatic pilots, etc. May be used as air or fluid pump—for pressure or vacuum. Standard 3/8 inch pipe thread with interchangeable ports. Will pump 7 1/2 gal. SAE 30 oil per minute at 300 RPM. Builds air pressure of 30 lbs. per sq. in. at 1000 RPM. Vacuum will draw 26 inches of mercury at 1750 RPM. Develops up to 120 lbs. per sq. inch of hydraulic pressure, which in conjunction with a 3 inch hydraulic cylinder, will lift 840 lbs. minimum. Runs forward or reverse. Self aligning shaft. Die cast aluminum housing 6x4x4 inches. Has stainless alloy steel vanes and impeller. Made by Bendix Avia. Corp. Spline terminal for direct drive—readily replaced with a pulley. Recommend a 1/4 H.P. or stronger electric motor as source of power. Rated capacity 1500 RPM with high overload factor. Special price for quantity users. Complete illustrated report and instruction booklet FREE with every pump. Send check or money order today. Postpaid in U.S.A.

$9.95

GROBAN SUPPLY CO. **1522 So. Michigan Avenue Dept. PS11 Chicago 5, Ill.**

NEW!—A real Gloucester fisherman on 1/8" scale. Complete kit $12.50. Other new kits and fittings to Model Shipways standards.

1948 Catalog 15c

MODEL SHIPWAYS, FOLIO 20
476 Main St., Fort Lee, N. J.

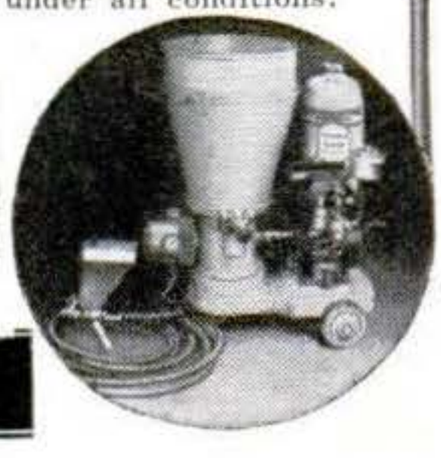
Masonry Spraying

. . . Today's Outstanding Business Opportunity

Beauty and protection are sprayed on old and new buildings . . . exterior and interior surfaces . . . by COLORCRETE. It's a plastic, water-resistant material, spread evenly over surfaces and forced into cracks by air pressure. Fuses to masonry with enduring tenacity. Many textures. Range of 30 smart colors. Fully proven by 20 years of actual use under all conditions.

BIG EARNINGS FOR COLORCRETERS

Colorcrete ties in with today's huge building program. Renews old buildings. Makes new construction more attractive and enduring. Large waiting market, because building owners get long lasting beauty and protective values at low price. Yet your selling price can be several times your basic cost. Machine is easy to operate. Moderate investment. Write or wire for complete information.



COLORCRETE INDUSTRIES, INC.
572 Ottawa Avenue Holland, Mich.

COLORCRETE

ATOMIC BALL POINT PEN

No. R360 Styled after one of the most expensive pens. You will like the balance, ease in writing and smooth performance. Writes on cloth, paper, wood or cardboard. Can be used for carbon copy work. The lacquered gold colored cap and clip has the wearing qualities of stainless steel. They are ideal for personal use and make a welcome birthday or Christmas gift.

20 YEAR SERVICE GUARANTEE

A 20 year service guarantee stands back of every pen. You may try the pen 10 days and if you are not satisfied 100% you may return it for full refund.

1 PEN $1.00 • 3 FOR $2.00

MYSTIC WEATHER WIZARD

No. H1180 Molded of plastic. Predicts weather 8 to 24 hours in advance. Fair weather brings out the Dutch boy and girl, foul weather is proceeded by the witch. It's, 5 1/2" high, 4" wide.

ONLY $1.00 Postpaid

SPORS CO. 9-47 Frank Le Center, Minn.

SPEAK A FOREIGN LANGUAGE—IN ONE WEEK

Imagine learning a foreign language well enough to speak it within ONE WEEK! Think of the countless new job opportunities that your new knowledge will open to you! Send for this revolutionary system without delay. Language series include phonetics, pronunciation and vocabulary in Spanish, French, Italian, German, Polish or Russian at $1.00 each. Japanese $2.00.

NEW METHOD GUARANTEED OR MONEY BACK!

SPARKLING PUBLICATIONS, Dept. P.S.
Central Savings Bank Building, 147 Fourth Avenue, New York 3, N. Y.

NEW! MINIATURE DUST MASK

Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose is all you do to operate. Protects against nuisance dusts, lint, coal, cement, grain dust, Hay Fever Pollen. Has 9 sq. in. filter.

For EYE protection against paint spray, dusts, gases, fumes, smoke, order our Fog-Proof Rubber GOGGLES.....$2.00 p.p.

Order Today **$1.00 POST PAID**

JERRY BRYANT, Dept. PS, 919 N. Michigan Ave., Chicago 11, Ill.

Say You Saw It
In Popular Science

BACKACHE, LEG PAINS MAY BE DANGER SIGN

Of Tired Kidneys

If backache and leg pains are making you miserable, don't just complain and do nothing about them. Nature may be warning you that your kidneys need attention.

The kidneys are Nature's chief way of taking excess acids and poisonous waste out of the blood. They help most people pass about 3 pints a day.

If the 15 miles of kidney tubes and filters don't work well, poisonous waste matter stays in the blood. These poisons may start nagging backaches, rheumatic pains, leg pains, loss of pep and energy, getting up nights, swelling, puffiness under the eyes, headaches and dizziness.

Don't wait! Ask your druggist for Doan's Pills, a stimulant diuretic, used successfully by millions for over 50 years. Doan's give happy relief and will help the 15 miles of kidney tubes flush out poisonous waste from the blood. Get Doan's Pills.

Copyrighted material

WANTED
MAN WITH CAR

No Time Like Now to Get In *McNess Business*

It's no trick to make good money when you use your car as a McNess "Store on Wheels." Farmers buy everything they can from McNess Men because McNess Products are tops in quality, represent extra values. Attractive business-getting prizes and premiums; also money-saving deals to customers make selling McNess daily necessities a snap.

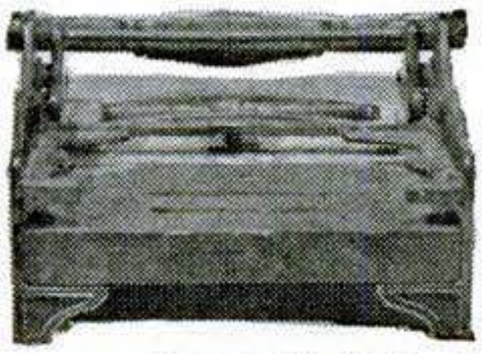
Use Your CAR to Raise Your PAY

We Supply Capital—Start Now!

There's no better work anywhere. Pays well, permanent, need no experience to start, and we supply capital to help you get started quick. You begin making money first day. Write at once for McNess Dealer Book. It's FREE. Tells all — no obligation. (1)

THE McNESS CO., 484 Adams St., Freeport, Ill.

PRINT YOUR OWN



- CARDS
- LETTERS
- POSTCARDS

25% Deposit Required **$3.95** Complete

Dealers send for Discounts

COASTAL DISTRIBUTORS
553 Market St. Newark 5, N. J.

"JACKPOT" AMUSEMENT MACHINE

• Great fun maker for Rumpus Room, Club or Tavern. Soon pays for itself. Fully automatic payout, three reels, with all the usual winning combinations . . . cherries, lemons, etc. Double jackpot. Rugged lifetime construction. *Guaranteed* to satisfy or money back. Service manual makes it easy to understand how to operate machine successfully. Takes space only 14½ x 11⅛ in. Ht. 18½ in. Shpg. wt. 47 lbs. CHOICE OF 5c, 10c, or 25c PLAY. Send $20.00 deposit, balance C.O.D. plus express charges. Immediate delivery.....Each, **$189.50**

WEBB DISTRIBUTING CO. INC.
6 S. KEDZIE AVE., CHICAGO 12, ILL.

Saves Time, Effort, Money in

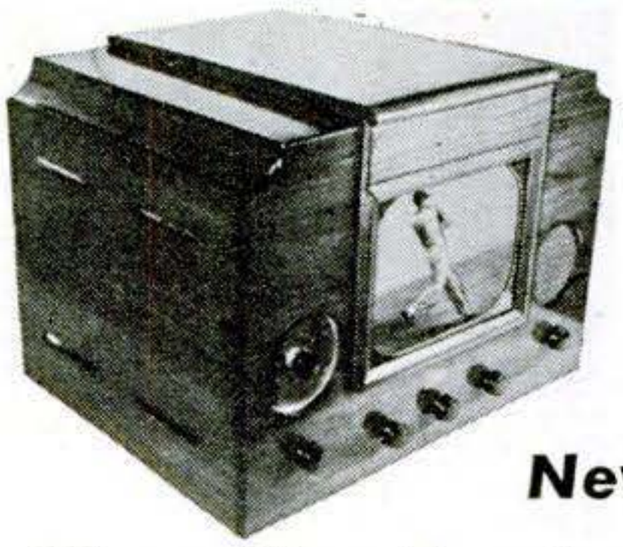
APPLIANCE REPAIRING!

New Model "60" checks all appliances. AC ammeter range 0-15 Amp. Serves as wattmeter. High sensitivity neon tube. Checks thermostats. Tells instant it cuts in or out. Is all 'round trouble shooter. Only **$14.50** complete.

FREE *with each tester. New Complete Practical Course in electrical appliance repairing. Write for circular.*

HANLAN CO., 1419-B, West Jefferson, Los Angeles 7, Calif.

LOW-PRICED LARGE-IMAGE TELEVISION IS HERE!



ONLY

$289.50

Transvision's New 12" Tube Kit

Gives You Larger Image Than Sets Selling at $500

• Here is your chance to get low-priced, large-image television with an easy-to-assemble Transvision Television Kit! After only 20 working hours you'll have a ringside seat at fights and ball games with a "big-as-life" television set.

Nothing extra to buy! Price includes specially designed folded dipole antenna, 22 tubes, R. F. unit pre-assembled and pre-tuned for all stations, *true F. M. sound (besides 12" picture tube large enough for 60 people!)*. Even solder is supplied!

If you can read a road map you can put a Transvision kit together! Complete novices have done it by following the simple step-by-step directions. All you need is a screwdriver and soldering iron to finish off the assembly. Factory guarantees high quality, clear, sharp reproduction as good as sets selling at twice the price.

So, join over 10,000 satisfied people who have saved money by putting an easy-to-assemble Transvision Television Kit together. *Beat high-priced finished set costs!* Order today. A $25 deposit will assure early delivery. (Beautifully turned walnut cabinet available, for those who wish it, at low cost.) (Also, a limited number of 7" tube kits still available at $169.50)

MAIL THIS FOR FREE DETAILS

Beacon Television, Inc., Dept. PS-11B
143 E. 49th Street, New York 17, N. Y.

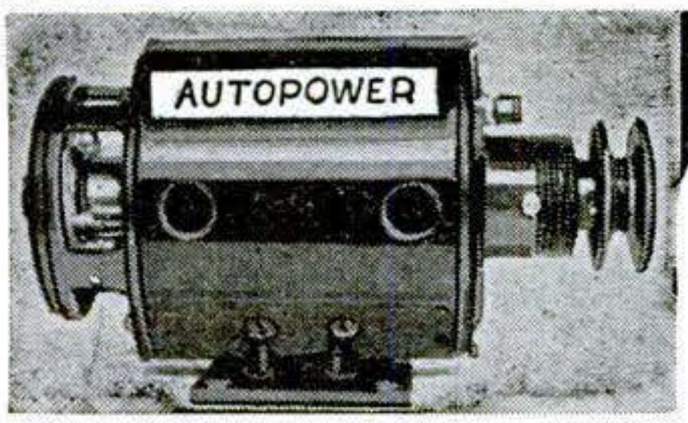
Gentlemen:
Please send me more information about Transvision's new easy-to-assemble, large image 12" tube television kit.
☐ 12" tube set (75 sq. in. image)
☐ 7" tube set (25 sq. in. image)

Name.....

Address.....

City.....State.....

Say You Saw It In Popular Science



TURN SCRAP INTO MONEY

AUTOPOWER tells you how in plain, easy, simple, and illustrated instructions that anyone can follow. Change auto generators into useful, practical AC and DC generators and motors with voltage from 2 to 1,000 volts, for power, light, welding, radio, sound, etc. No previous experience nor special tools needed. Generators can be driven by wind, water, fan belt, etc. Already used and endorsed by thousands. Send for your copy of "AUTOPOWER." Only $1.00 postpaid.

AUTOPOWER INC., 2118 Pine St., St. Louis 3, Mo.

Copyrighted material

32 DRAWERS ONLY $4.95

for home or shop

THE JIFFY CABINET

THE HANDY WAY TO KEEP SMALL PARTS, WASHERS, NAILS, SCREWS, NUTS, BOLTS AT HAND

Sturdy all metal cabinet

Identity card on each drawer

Here's the smart way to keep small items in your shop or at your work bench—The Jiffy Cabinet: holds 32 or 64 spacious, sturdy drawers that put small parts at your finger-tips. Metal flange drawer guides. Solidly built all metal cabinet insures long time-saving service. Why fumble? With the Jiffy you know where it is—you can get it in a hurry. 32 drawer size—$4.95; 64 drawer size—$7.95 postpaid. Send check or money order—no C.O.D.'s please.

KAYTEE PRODUCTS

Box #588 • Canton, Ohio

MAGIC LIQUID CASTS

PLASTICS

THE GREATEST THING IN PLASTICS!

A New Liquid Plastic! Pour **PLASTICAST** into any kind of mold (rubber, metal, glass, plaster, etc.) and it hardens in a few minutes into a solid, clear-as-glass plastic! No machinery or tools required. **PLASTICAST** has unlimited possibilities . . . novelties, toys, jewelry, gems, knick-knacks; fascinating brilliant, clear or colored plastic articles. Being transparent it is ideal for imbedding flowers, butterflies, photos, souvenirs—an endless variety of useful things. Can also be cast into rods, sheets, blocks, ANY SHAPE! Make **PLASTICASTING** a thrilling new hobby or a profitable business! No experience required; start casting beautiful articles 10 minutes after you receive your outfit! MASTER OUTFIT contains 4 molds, dye, directions, imbedding material, accessories and enough **PLASTICAST** for making about 200 articles.

COMPLETE MASTER OUTFIT, (postpaid U.S.A. only)..... **$3.00**

(C.O.D. orders accepted with $1.00 deposit)

FREE Catalog listing hundreds of molds, mold making materials for casting with **plastics, metal, plaster, wax, rubber, wood, liquid marble, liquid ivory, etc.,** sent free for 3c stamp.

SPECIAL OFFER UNTIL CHRISTMAS—2 Beautiful Cameo molds free with orders! With these molds and master outfit you can make over $200 worth of attractive jewelry!

PLASTICAST CO., (Dept. A)

5961 Madison St. Chicago 44, Illinois — **P.O. Box 987 Palo Alto, Calif.**

How to Start YOUR OWN BUSINESS

And Reap BIG Profits!

Plastics, one of the most revolutionizing and rapidly expanding industries, offers a great opportunity to all enterprising **men** and **women.** This is one of the few industries in which home manufacturers thrive and prosper. You can start even on a spare time basis in your own home, and expand rapidly into a full time business, paying good profits.

LIQUID MARBLE

Make LIQUID MARBLE the amazing Plastic, with a thousand uses. LIQUID MARBLE can be poured into FLEXIBLE MOLDS for casting all kinds of artistic and serviceable articles such as: ornaments, novelties, desk sets, paper weights, book-ends, souvenirs, stationery, toys, etc.

FLEXIBLE MOLDS

Make your own FLEXIBLE MOLDS. The cost is low—in fact, a large sized mold costs but a few cents. Hundreds of casts can be taken from a single mold.

NO EXPERIENCE NEEDED!

No skill or previous knowledge is necessary. All you do is follow our easy-to-understand instructions.

UNLIMITED MARKET

The market is literally unlimited. You will find steady year-round demand in your own community. Your problem will not be in Selling but in supplying the huge pent-up demand. Moreover, we supply you with names of **buyers** for your finished products.

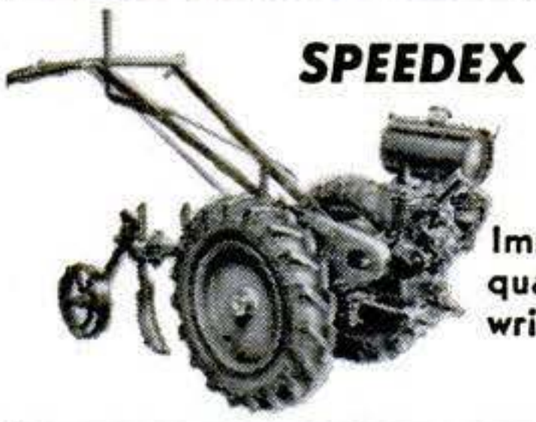
WRITE TODAY

Bing Products will show you how to start with a small investment and build a permanent, independent, profitable business! Don't fail to grasp this opportunity! Write today for FREE CATALOG.

BING PRODUCTS

Dept. B-25, 88 Broad Street Boston 10, Mass.

GARDEN TRACTORS



SPEEDEX

SAVE UP TO $100.00 OR MORE BY PURCHASING NOW

Immediate delivery in limited quantities. For full information write for free circular.

P-1247-53

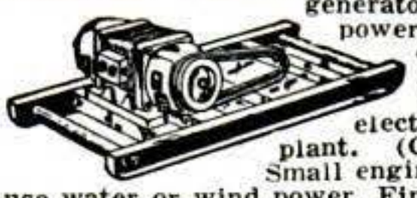
POND GARDEN TRACTOR COMPANY

BOX 216 RAVENNA, OHIO

WAR SURPLUS 110 VOLT • 60 CYCLE • 2500 WATT

POWER PLANT GENERATOR

WEIGHT 200 LBS LIST PRICE $276.00



NEARLY NEW 110-volt single phase 60 cycle A-C generator. Exactly like commercial power. Self-excited. No other equipment required. Fine for ranchers, taverns, sportsmen. Generate your own electricity. Powerful portable plant. (Complete except engine.) Small engines easy to pick up or you can use water or wind power. Fine stand-by power for farms. Contractors use for on-job power saws, drills, etc. Full instr. installing, using. Guaranteed perfect. Order now or write for details.

Only **$89.40** FREIGHT PREPAID U.S.A. ONLY

LECO ENGINEERING CO., Box 908 PS-E, Lincoln, Nebr.

FIX SEWING MACHINES

BIG MONEY. Spare or full time. Open your own neighborhood shop. Thousands need repairs. Send for complete Repair Manual—only $1.98 postpaid. Money back guarantee.

SEWING MACHINE SERVICE CO. **Hamilton 26, Ohio.**

Say You Saw It In Popular Science

For the amateur and professional artist and sculptor. Giving detailed study of every part of the body.

"The Book They're Talking About"

Contains over 300 illustrations, charts and notes

ART ANATOMY OF THE HUMAN FIGURE

MALE AND FEMALE, POSED AND IN ACTION

(Sent in plain wrapper.) Outside of U. S. A. Send $1.25

MAJOR BOOK CO., DEPT. 520-A, LYNBROOK, NEW YORK

ONLY $1.00

Copyrighted material

Ball-Bearing *SPEED WHEELS*

Juvenile Wheels, solid tires, no bearings

7" wheels.....60c
6" wheels.....50c
4" wheels.....30c

Semi-pneumatic tired wheels

12 x 1.75".....$3.25
10 x 1.75".....$2.75
8 x 2" $2.00

Industrial wheels, for heavy loads

10 x 2.75" Semi-Pneu. $6.75
10 x 2.75" Single valve tube Pneu. $7.25
8 x 1" $4.90
6 x 2" $2.80

Dealers Wanted

FREE BLUEPRINTS WITH ALL WHEEL ORDERS
Enclose check with order

JIM BROWN TOY COMPANY
1093 Home Ave. **Akron 10, Ohio**

FLASHLIGHT INSPECTION LAMP ASSEMBLY

NEW—Govt. Surplus. Lights up the "Hard-to-get-at" places. Fine for mechanics, electricians, radio repairmen, filling station attendants, in the home, and many other uses. Plastic 12" extension (6" stiff and 6" flexible). Adjustable to any angle. Originally priced over $4.00. Our price Postpaid..... **$1.80** Ea.

Hundreds other items—WRITE FOR CIRCULAR
National Surplus Sales Co. 1810 Charlotte Kansas City 8, Mo.

Ideal For Xmas
ITS FUN TO BUILD A PEDAL CAR

Use our sturdy mechanical parts, featuring geared steering, for that big car feel, bicycle pedal belt drive, adjustable upholstered seat, & Ball & Bronze bearings through-out. Buy parts, or a complete chassis. Write for free price list.
NELSON-PRICE MFG. CO., Box 25, Rockville Centre, N. Y.

WANTED—*Ambitious Men*

who would like to go to this famous school. Stream-lined courses in Diesel, Diesel Electric, Electricity, Radio Mechanics, Refrigeration, Air-Conditioning. Write for FREE catalog.
BAILEY TECHNICAL SCHOOLS
1653 So. Grand Blvd. **St. Louis, Mo.**

REMEMBER! There is Only One

MAIL-ME-MONDAY
BOOKKEEPING AND TAX METHOD

The most talked-about **SERVICE** *in America*

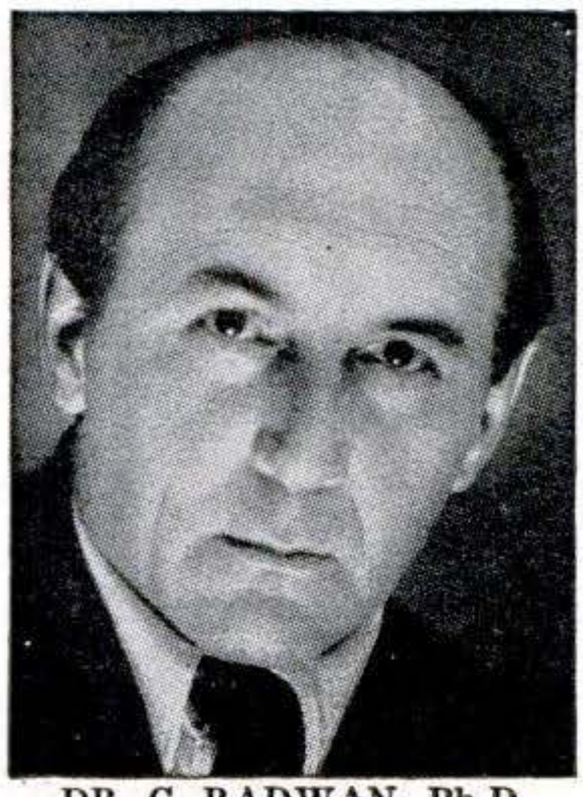
A trained staff DOES ALL your record-keeping and tax compilations at one low fee!

DESIGNED *for* **YOUR** *business*

Have the **BEST**--
Get the **FACTS**

LOOK IN YOUR PHONE BOOK FOR
"MAIL-ME-MONDAY"
OR WRITE DEPT. P-9
1929 FIRST AVENUE
SAN DIEGO 1, CALIFORNIA
More than 200 offices in U. S. & Can.

HOW TO OVERCOME FEAR, WORRY
REGAIN PEACE of MIND, HAPPINESS, JOY of LIVING



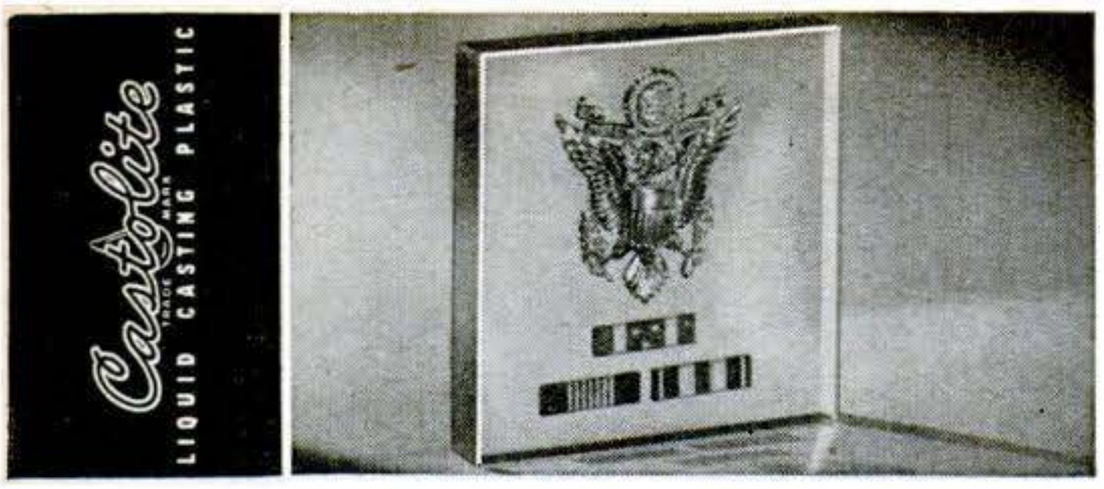
DR. C. RADWAN, Ph.D.
(Vienna University)

If you are among the many beset by personal mental problems resulting from the war, or find social and economic readjustment difficult, take courage! Your anxiety can be quickly replaced by relaxation; you can develop a strong, powerful personality, able to meet and solve all your problems, regain self-mastery, mental and physical health. Dr. C. Radwan, Ph. D. (Vienna University), student of Yoga techniques in India, founder of Radwan Institutes all over the world, has perfected a method of mechanized suggestion, through recordings, enabling you in your own home to control your subconscious mind, regain mental harmony and joy of living. No will power, no study needed. The booklet "Your Health, Success and Happiness" fully explains this simple yet fundamental system. It will be sent to you free, with Self-analysis Forms for diagnosis of your problem. Join the thousands who have benefitted! Write today to:

HOME METHOD OF APPLIED PSYCHOLOGY

RADWAN INC. **Dept. A, 366 Madison Ave.,** **New York 17, N. Y.**

Copyrighted material



NEW LIQUID PLASTIC

MAKES SWELL GIFTS, NOVELTIES, THINGS TO SELL!

• Thousands are having fun, making big extra money, using CASTOLITE, the wonder liquid plastic that pours without heat or pressure. Use crystal clear or with brilliant colors. Embed real flowers, insects, coins, medals, photos, for plaques, paper weights, etc. Make useful objects like book ends, trays, picture frames, coasters, novelty jewelry, toys. Also make gears, parts, models. Can be sawed, carved, drilled, turned.

20 - PROJECT KIT $3.50

(West Coast, Canada & Mexico) $3.75

Special Casto-Kit now ready. Contains materials and instructions to make useful objects at once. Get into this fascinating new field now, and have unusual gifts or make fine sales before Christmas. Send $3.50 (West Coast, Canada and Mexico, $3.75) for your Casto-Kit, postpaid. Or order C.O.D. For instruction manual alone, send 25c. Illustrated folder FREE.

THE CASTOLITE COMPANY
Dept. M-4 Box 211 Kenilworth, Ill.

Very adaptable, the plastic with 1001 uses.

DEALERS—Write for prices.

PILOTS' JACKET

(Left) **NEW AIR-CORPS SURPLUS.** B-15 Style. Green poplin. Warm alpaca lining. Genuine Mouton fur collar. 4 Pockets. 36-46.....**$14.75**
(Right) **SHEEPSKIN LINED JACKET.** Brown leather. Army B-3 style. Zipper front. 34-46...**$15.95**
PILOT'S CAP. (illus.) Brown leather. Lamb's fleece lining and ear flaps **$2.50**
Sheepskin Leather Pants **$5.95**
Write for FREE Illus. list Army Surplus Orders sent postpaid except C.O.D. Satisfaction or Money Back.

CONSUMERS CLOTHING CO. Box 3-S, 26 Greene St., New York 13, N.Y.

Mows and Trims Lawns

In One Simple Easy Operation

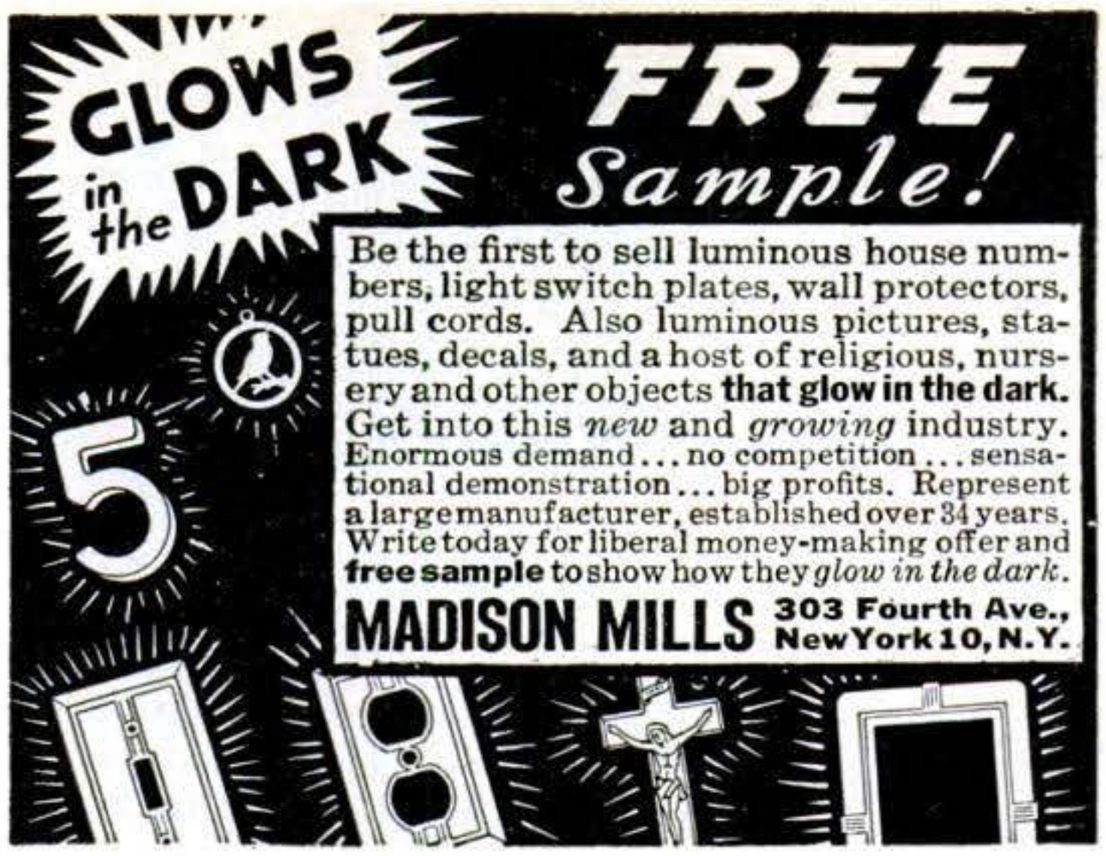
8¼ Lbs.

Save Time and Labor with a

MONTAMOWER

New model. New type metal handle has special device to adjust cutting height. Drive shaft now mounted on free rolling, factory lubricated, and sealed ball bearings. No tired backs or aching arms. 8¼ lbs. of live precision made mechanism that first gathers, then cuts smoothly a clean 16" swath through grass, dandelions, spike grass and weeds. No noise or clatter. As modern and efficient as your electric razor. Cuts right up to walls, fences, trees or posts; leaves no fringes to be trimmed by hand. Cutters are self-sharpening. Built to last many years. Many thousands in use. Sold direct from factory. Costs little. Write at once for guarantee information and literature.

MONTAMOWER DISTRIBUTING CO.
830 Keeler Bldg. GRAND RAPIDS 2, MICHIGAN



AIR or LIQUID TANKS

Airplane oxygen tanks (used) good condition, holds up to 400 lbs. pressure: non-rusting stainless steel, weighs 18 lbs., 10½ gal. capacity, 24" long x 12" diam., **$4.98.** Same specifications 24" long x 6" diam., weighs 5 lbs., 3 gal. capacity. **$2.98.** Ends tapped for ¼" standard pipe thread. Air check-valve to fit tanks. $5.00 value. **98c.** Ideal for compressed air tanks, some bottled gas, or liquids, water supply for house trailers, compressors, floating rafts, buoys, net floats, air horns, air brakes, etc.

Prices FOB, Kansas City—No COD orders

MIDWEST BUY ANYTHING CO.

1520 Locust St. Kansas City, Mo.

Hundreds of other bargains—Write for Circular

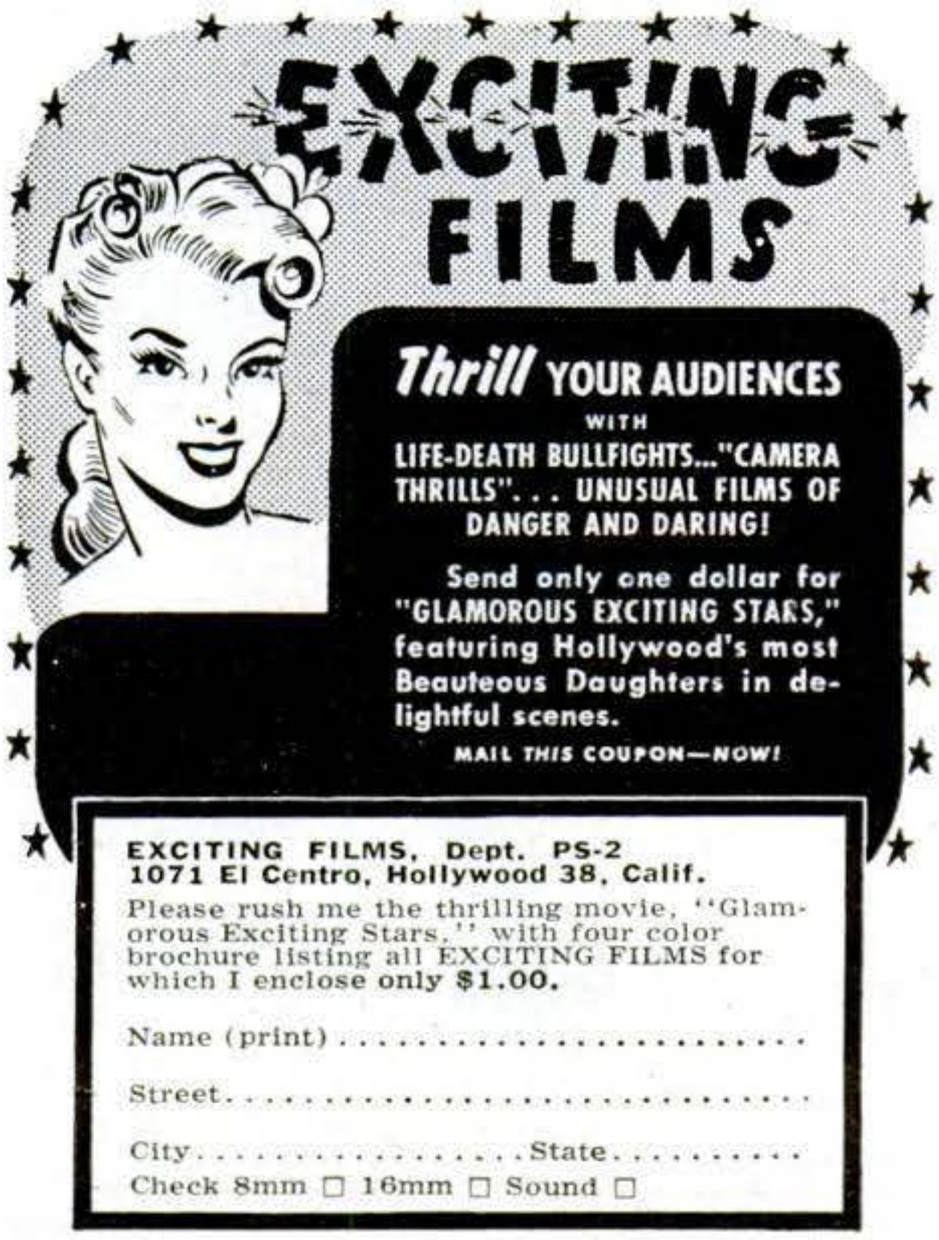
---

3 In 1 AIR PISTOL

SPORTSMAN JR.—Sensational, low-priced **air** pistol. Ruggedly built, **full size** target gun shoots **either** standard BBs, pellets **or steel** darts. Fast, single-action compression chamber. Single shot, **silent** shooting. **Use** indoors or outdoors. Modeled after famous target pistol Economical to operate. Die cast all metal non-slip moulded grip; machined steel chamber and barrel. 8-in. long; 4½-in. deep; full size, weighs 15 oz. **EACH $3.49**

BBs, 3 pkgs. 25c; .177 pellets, 500 for $1.50; steel darts, 35c package. Order Plenty of Ammunition.

JOHNSON SMITH & COMPANY, Dept. B-70, Detroit 7, Michigan



Copyrighted material

Ready to do Your Bidding!

NEW POWERS TO MATCH *Life's Demands!*

Smash your fears and worries, Conquer your nerves and Inferiority feelings.

Our Home-Study, Self-Discovery-Development Plan may be the very thing you need right now to wake up your personality and unleash creative energy and insight? Why remain as you are? Dare to become something better. Desert that stale rut for development and promotion. The author of this Plan developed and used it on himself to recover from a nervous and financial bogdown. Also letters in our files from students report wonderful results. Money back if you are not satisfied. Write for FREE LECTURE and full details without obligation, TODAY.

FILL IN, CLIP AND MAIL TODAY TO

SCHOOL OF PERSONAL PSYCHOLOGY
Chartered Non-profit Correspondence Education
10th Floor Washington Bldg., Louisville 2, Ky.

RUSH TO ME AT ONCE FREE LECTURE AND FULL DETAILS on your Self-Discovery-Development Plan of Home Study, without obligation. I shall read it carefully.

Name.....

Street.....

City.....Zone....State.....

SHOE REBUILDING OFFERS BIG INCOME

Own your own shop or earn big money as skilled shoe rebuilder. Growing demand everywhere at top wages for men who know how. We teach you quickly at only school of its kind in United States. Costs nothing under G.I. Bill of Rights. We help you get big-pay job or start your own shop.

FREE! BIG 16 PAGE BOOK explains everything. Send for your copy today.

C. W. GUSIAS, MODERN SHOE REBUILDING SCHOOL
2935 W. Belmont, Chicago, Dept. P.S. RUSH POSTCARD TODAY

GIANT

Astronomical Telescope

100 diameters magnification. (10,000 area magnification) 3 inch diameter steel main tube 50 inches long. Brass focusing tube. Tripod 6 feet high. Equatorial mounting. Ready to set up and use. Full power and clear vision guaranteed. Price $15.00. 20% deposit on C.O.D. orders.

DEPT. BT, SUFFOLK SCIENCE SERVICE, MANORVILLE, N. Y.
"NO EXPORT ORDERS ACCEPTED"

"PLASTICS"

Work in a fascinating and profitable hobby. Just out—our latest fabricating manual. Tells you how to work with Plastics. Our new Catalogue provides all needed materials: Plexiglas—Lucite—Tenite—Catalin—Acetate—all in sheets, rods, and tubes. Complete line of cements, dyes, accessories and supplies. Send 20¢ today for Catalogue and Handbook. We apply this amount on initial order.

HOUSE OF PLASTICS
8648 Linwood Avenue, M. O. Dept., Detroit 6, Michigan

AIRCRAFT SUPERCHARGER

LUBE PUMP

Designed for pumping liquids up to 3 G.P.M.

A gear type impeller pump with two pumping units in one housing. Precision built of aluminum, cast iron, bronze and steel. Compact construction—only 3½" Dia. x 8½" long.

- Vacuum, 29½ inches of mercury.
- ½" Dia. Threaded and keyed shaft.
- Brand new! Sealed in Pliofilm.
- With Test Sheet and Instructions.

Immediate delivery. Order now! Post paid anywhere in U.S.A. upon receipt of check or M. O. C.O.D. orders include postage and extra fees.

Pressures up to 200 lbs. per Sq. In.

From 1 to 3900 R.P.M.

Originally cost $24.00. **Now only** **$3.95**

FISCHER LABS 1729 N. MOBILE, CHICAGO, 39, ILL.

Our Finest Precision REBUILT

MOTOR BLOCK ASSEMBLIES

Carries the Same 90 DAY GUARANTEE As a New Motor Assy.

Sold Outright or Exchange

Rebuilt by skilled mechanics. Assembly has Rebored Block with New Pistons, Pins, Rings, Reground Crankshaft, and all New Bearings. Guaranteed 90 Days.

Allowance on Old Motor
We ship at outright price. Send your motor prepaid, must be suitable for rebuilding. Send in notarized bill of sale showing title number if any. We refund difference when we receive your motor.

$5.00 Crating Charge

FORD BLOCK ASS'Y.

Year	Type	Outright	Exch.
28-31	4 cyl.	$ 98.00	$73.00
32-47	6 & 8	139.00	89.00
Mercury 39-47	V8	149.00	99.00
Chevrolet 29-47	6 cyl.	117.50	87.50

DODGE—3¼" bore

Year	Type	Outright	Exch.
35-47	6 cyl.	$129.00	$99.00
Plymouth 35-47	6 cyl.	129.00	99.00

Specify exact year, make and model when ordering. Send for catalog on motors not listed.

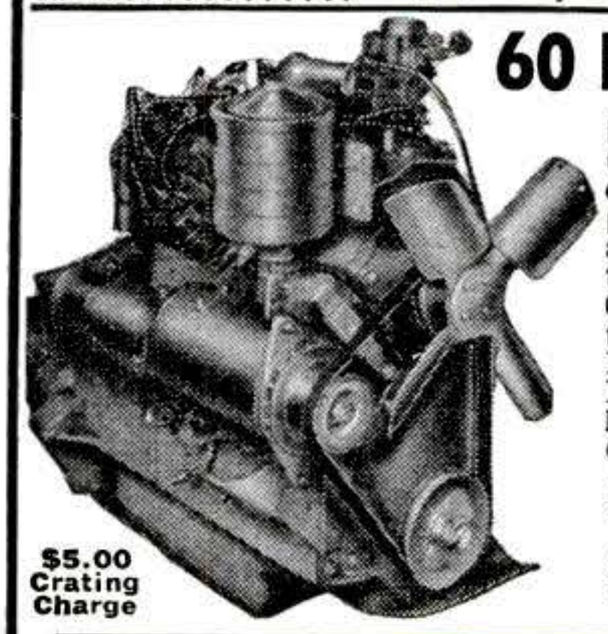
POWER TAKE-OFF for JEEP ENGINE

Bolts to clutch housing on the Jeep engine. Has a spline shaft to engage with clutch and extending from rear is a keyed shaft on which pulley can be mounted. Hand lever controls clutch.
SF4N-23J— Each..... **$42.50**

NEW 5 Gal. CANS

FOR GAS, OIL OR WATER
Vented for Safety.
Self-locking Safety Cap
Extra Heavy Construction
Will Float When Full
Size of can, 18" high, 6¼" thick, 13" wide.
SA35U-60—
Lots of 5, ea. 1.15
Lots of 50, ea. 1.05
Lots of 100, Each **98c**

60 HP. JEEP Engines

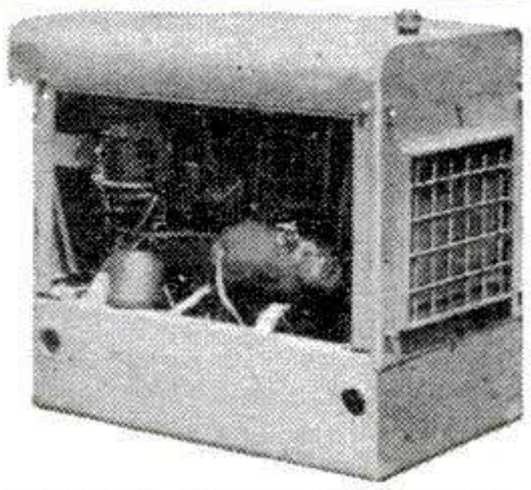


$5.00 Crating Charge

Reconditioned, Tested and Guaranteed in perfect running order and ready to run. Every part is checked to be perfect and carries a 90 Day Guarantee same as a new engine.
COMPLETE with . . . Generator, Starter, Distributor, Coil, Fan and Fan Belt, Water Pump, Fuel Pump, Intake and Exhaust Manifolds, Carburetor, Oil Filter, Spark Plugs, Flywheel, Clutch and Pressure Plate, and Wiring.

Outright, SG58R-003, Each $137.50

New Willys JEEP Enclosed Power Unit



60 HP. 4 cyl. engine 134.2 cu. in. displacement, 3⅛ bore 4⅜ stroke. Complete with radiator, gas tank, clutch power take-off with 1⅛" keyed shaft, and all accessories. **READY TO RUN, NEW, COMPLETE, SG60N-002—F.O.B. Chicago.**

$325.00

SEND 25% CASH WITH ORDER, BALANCE C.O.D.

J.C. WHITNEY & Co.

1917 Archer Ave. Chicago 16, Ill.

Say You Saw It In Popular Science

GET INTO CARTOONING!
Learn cartooning from a **professional** cartoonist! Create **original** cartoons and ideas. Send for free details about course. Also cartoonists' magazine. Full of lessons, plans, etc. Only 25c coin postpaid.
Hartman Studios, 2776 California Court, Lincoln 8, Nebr.

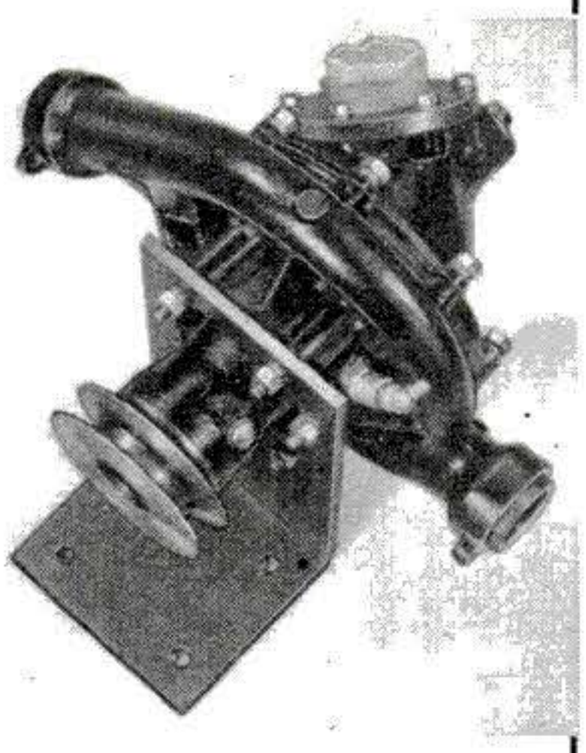
Copyrighted material

WAR SURPLUS BARGAIN SPECIAL

BELT DRIVEN CENTRIFUGAL

PUMP

READY TO USE ON ANY LIQUID PUMPING NEED



NOW ONLY $29.75

FOR HOME WATER SYSTEMS, IRRIGATION, FIRE PROTECTION, DRAIN BASEMENTS, PONDS, ETC.

● A super value for all types of intermittent service in pumping large volumes of liquid for stock watering, home and shop water systems, irrigation, draining pools, basements, etc. At 1750 RPM on 23 foot head will pump 42 gallons per minute; at 3600 RPM on 52 foot head will move 88 gallons per minute. Cast aluminum housing. Accurately machined bronze impeller vanes. Complete with mounting bracket and 3½ inch V belt pulley. Run with electric motor, gasoline engine, power take-off on tractor, etc. Shaft rotates on sealed ball bearings with grease gun fitting. Has 1½ inch threaded intake flange, two 1 inch outlets. Use one or both as necessary. Made for Packard Motor Car Co. for use in Rolls-Royce Merlin Aircraft engines. Comes complete with pulley and mounting bracket. Original cost approx. $147.00. Sold F.O.B. Chicago. Shipping weight 23 pounds. Complete engineering reports and operating instructions free with pump. You can't beat this pump value at anywhere near this price. Satisfaction guaranteed.

ORIGINAL COST APPROX. $147.00
IMMEDIATE DELIVERY FOB CHICAGO
SPECIAL PRICE, WHILE THEY LAST **$29.75**

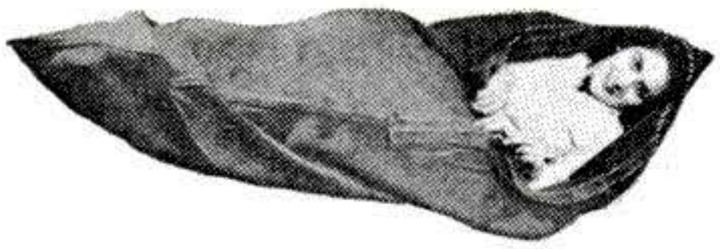
GROBAN SUPPLY CO. 1522 So. MICHIGAN AVENUE Dept. PS-11, Chicago 5, Ill.

INSTALL-SERVICE OWN OIL BURNER $1

Save up to $150! Send for the famous **DELTA PHOTO-INSTALLATION MANUAL.** Simple, easy step-by-step photos of a complete oil burner installation. Complete with all necessary plans, drawings and easy-to-follow directions. Published under exclusive copyright at $5.00. **SPECIAL OFFER—CLIP $1 to this ad and mail today!**

DELTA HEATING CORPORATION
85-03 Northern Blvd., Jackson Heights, New York City

War Surplus Bargains



Perfect all wool Olive Drab

SLEEPING BAG

Comes in handy for fishing trips, hunting, camping, boating, just roughing it or use as auto robe and many other purposes. Has warmth of 2 blankets; zipper slide fastener; tie-strap on bottom; approx. Gov't cost $12.90. **our price Ea.** **$3.95**

Outside Cover for Sleeping Bag—Water repellent **$2.39**

PUP TENTS

Perfect—2 Man Size for Scouting, Camping, etc. Without Pole **$2.95**

NEW GOGGLES Set comes complete. Kit with 1 extra interchangeable shatterproof, flexible, cellulose acetate lens. Green and white colors. A rubber flexible goggle frame. Back adjustment head strap. Made for A. A. F. Cost Gov't approx. $4.50. Ea. **98c**

NEW BENCH LAMPS Adj. type, for work benches and many other uses. Cost Gov't approx. $15.00. Only **$3.95**

HYDRAULIC JACKS for Heavy Duty Work (Perfect) 8 ton **$10.95**
20 ton **$44.50**

WATER PURIFIERS "Sunstill" New, used by Air forces and Navy to distill salt water into fresh drinking water. Complete—nothing else to buy. Our price **$4.95**

NEW PARACHUTES (Green Rayon) Approx. 36 sq. ft. Cloth good for making into ties, handkerchiefs, lining, etc., complete with canister, wght. approx. 10 lb. **$2.95**

WE PAY POSTAGE—No COD—Send check or money order

AMERICAN SUPPLY CO., DEPT. P.S., 5TH & BROADWAY KANSAS CITY, MO.

Learn Penmanship

Good penmanship makes favorable impressions and helps you win success, while poor penmanship will lead you to failure. It makes no difference how poor you now write, you can quickly and easily learn **Business Writing,** and you can learn **Shaded Writing** also, right in your own home during spare time by my **Simplified** Method, without cost of going away to school. Begin Now! Write for my FREE BOOK, "How to Become an Expert Penman," which contains valuable information, many specimens of penmanship, and tells how others learned to write well. If you enclose 10c, I will send you one of my favorite Pen Points, suitable for plain or shaded writing and your name with a beautiful flourished bird written on a card. Write for the FREE BOOK today. HURRY!

T. M. Tevis

T. M. Tevis, Box 25R, Chillicothe, Mo.

LAW FREE BOOK

Write today for FREE 48-page book, **"THE LAW-TRAINED MAN,"** which shows how to learn law easily in spare time at home through the Blackstone course prepared by 60 well-known law authorities. We furnish all material including 18-volume Modern American Law library. Many successful attorneys among our graduates. LL.B. degree. Moderate cost; easy terms; Money-Back Agreement.

BLACKSTONE COLLEGE OF LAW
225 N. Michigan Ave., Dept. 128, Chicago 1, Ill.
A Correspondence Institution Founded in 1890

LEARN TO DRAW & PAINT

LANDSCAPES, PORTRAITS, FIGURES, ANIMALS.
No Previous Training Necessary

IF YOU LIKE TO DRAW YOU HAVE TALENT. YOU CAN DEVELOP THAT TALENT THROUGH OUR **HOME STUDY COURSE.** LEARN TO DRAW AND PAINT IN YOUR SPARE TIME. WRITE FOR INFORMATION.

JOHN CLINTON ART INSTITUTE, Inc.
STUDIO C PALM BEACH FLORIDA

FURNACES

Gas Oil

Floor furnaces, RANGE burners, GAS burners for natural, mixed and liquid petroleum gases. GUNTYPE oil burners with controls. PRECAST fire boxes. BLOWERS, blower wheels, Bearings, etc. Exhaust fans. Wholesale and retail.

PEERLESS SALES, 4320 SHERIDAN BLVD., LINCOLN 6, NEBR.

STAY HOME AND MAKE MONEY!

—Men! Women! Get into profitable, uncrowded profession you can operate from your home or small office after short home training course. No capital required. No goods to buy. No age limit. Others earn $50.00 to $100.00 per week making famous Stephenson corrective foot devices to order. Foot sufferers everywhere pay gladly for relief. Send today for FREE BOOKLET.

STEPHENSON METHOD, Established 1894, 12-62 South Market St., Boston, Mass.

What Every Mason Wants

We have Important Masonic books for **Blue Lodge, Chapter, Commandery, Scottish Rite,** and **Shrine.**

OUR RITUALS ARE USED THE WORLD OVER

Send for **free** catalog of books and rituals for Masons, Odd Fellows, Knights of Pythias, Knights of Columbus, etc.

EZRA A. COOK, Publisher, P. O. 796, RN Chicago 90, Ill.

Enjoy—WORLD'S MOST FASCINATING HOBBY! SEND FOR FULLY ILLUSTRATED BOOK TODAY!

GET THE FACTS on model railroading! Leading authority shows how easily, inexpensively you can join in the absorbing hobby enjoyed by thousands of mechanics, business and professional men. Scale model railroads look, perform like the real thing!

GET STARTED NOW! Send 10¢, coin or stamps, for illustrated booklet, "Model Railroading for You".

MODEL RAILROADER MAGAZINE
Dept. 1611, Milwaukee 3, Wis.

Copyrighted material

Get A SEAMAN ROTARY TILLER

Better Yields — Better Crops

Because this farm-size rotary tiller prepares seedbeds most ideally suited to your soil and crop conditions, it helps produce *higher yields* and *better quality* crops. Can be adjusted for fine pulverization, coarse or medium tillage . . . just the way you want it. Mixes fertilizer and humus into the GROWING AREA of seedbed; aerates soil; eliminates air pockets and hard plow soles; conserves moisture; promotes earlier and more complete germination of seed; helps to destroy many crop pests and certain varieties of fungus; provides effective weed control; reduces erosion . . . all with ONE machine!

SEAMAN ROTARY TILLERS are available in power take-off and motorized models 3 to 7 ft. tillage widths. See your Seaman dealer and write for complete information.

SEAMAN MOTORS, Inc. 315 N. 25th Street Milwaukee 3, Wis.

Surplus Patches

50 EVERY ONE DIFFERENT FOR ONLY $1

Army Shoulder Patches-Officers Collar Insignia-Large Flying Squadrons in multi-colors—all in this BIG bargain pack of 50 all different sent Post-paid on receipt of only **$1.00.** Some factory rejects—most however perfect. Complete catalog with every order. **Biggest bargain ever.** Money back if not satisfied. No C.O.D.'s. Best Assortment to early buyers. Visit our store when in N.Y. (near Wanamakers).

THE INSIGNIA MART
703 Broadway, Dept. S2, New York 3, N. Y.

Air Cooled—GASOLINE ENGINES

BRIGGS-STRATTON *Model N*

1½ Hp. Perfect size for Power Lawn Mowers, Garden Tractors, Grain Augers, Scooters, etc. (Used) thoroughly reconditioned. Guaranteed.

IMMEDIATE SHIPMENT **$54.50**
Sale Price—FOB, K. C.

MIDWEST SURPLUS SALES CO. 1520 Locust St. Kansas City, Mo.

EYE-GLASSES BY MAIL

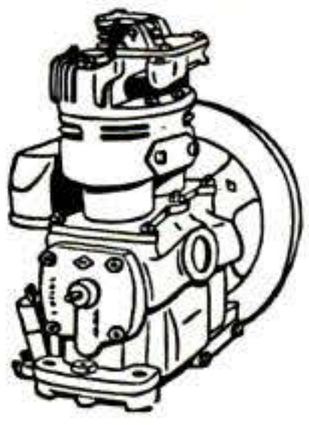
16 Days Trial

Write Today for Free Catalog. Send no Money

ADVANCE SPECTACLE COMPANY
537 South Dearborn Street, Dept.SP-11, Chicago, Illinois

AIR COMPRESSORS

Bendix-Westinghouse 4 cu. ft.



2 Cylinder BUS and Truck Piston type ball bearing. Pressure feed oil system.

Positively one of the finest and most accurately built air compressors on the market. Each Compressor completely checked and in good operating condition.

Ideal for home work shop; garage; filling stations; paint spraying; farms; factories, etc.

Original List Price, $160.00

Our NEW Low Price FOB, K. C. **$29.50**

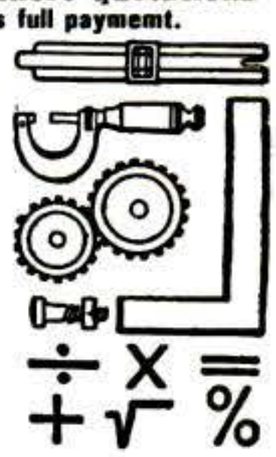
MIDWEST SURPLUS SALES CO. 1520 Locust St. Kansas City, Mo.

SUCCESS!

How to Get Along in this World

Here, gathered together for the first time, are 5000 gems of worldly wisdom on how to live joyously, successfully . . . how to handle people, make money, be happy. Written out of **actual experience** by the best brains of mankind . . . during the past four thousand years! To-the-point, **workable** instructions on getting ahead. Only $1. Included are lessons on **how to use** these quotations in your daily life. **Check coupon below and mail with only $1 as full payment.**

Short-Cut Mathematics
COMBINED WITH
Practical Mechanics Simplified



Be a "master mind." Learn how to juggle figures, do baffling tricks with numbers. Add long columns of figures this lightning-quick, short-cut way. Multiply 4 figures by 4 figures without old-fashioned multiplication. Here are speedy, simplified systems used by stage "wizards," expert accountants, engineers. Only $1. Course includes illustrations, problems, answers. Mail coupon below!

watch and clock repairing

Learn at Home—In Your Spare Time

Prepare for a happy future of prosperity, security . . . and get a big-pay job now. Fascinating, high-grade occupation. You can **EARN WHILE YOU LEARN.** Excellent field for part-time work at home.

Practical Course in HOROLOGY

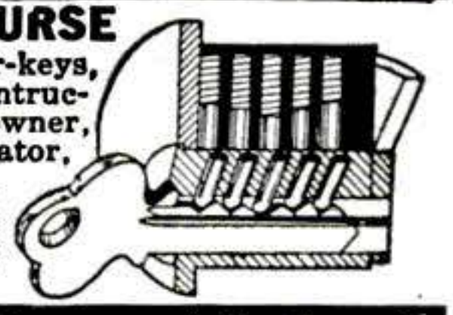
Thorough self-instruction training in American and Swiss watches, clocks. Special sections on alarm clock repairs. Interesting. LEARN-BY-DOING instruction method. Learn **QUICKLY,** easily. No previous experience necessary. WATCHMAKING IS BASIC TRAINING FOR AIRCRAFT INSTRUMENT WORK and other scientific precision jobs.

Amazing Low Price! • Money-Back Guarantee!

Get into this fast-growing field NOW . . . big opportunity . . . don't delay. Complete price is only **$4.95,** postpaid. This includes everything. Mail coupon below.

locksmithing and key making

PRACTICAL UP-TO-DATE COURSE

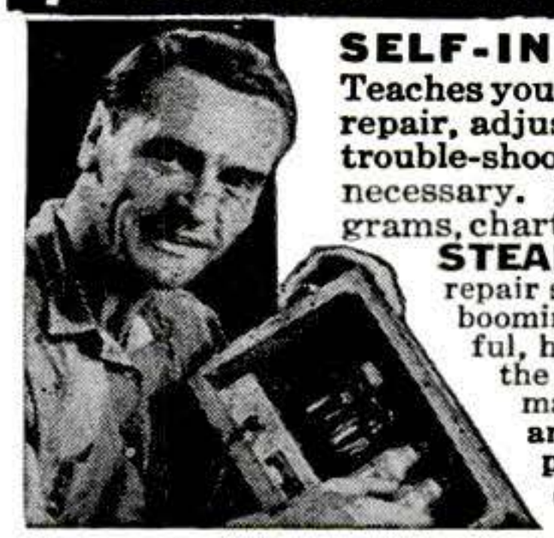


How to pick locks, de-code, make master-keys, repair, install service, etc. New, self-intruction lessons for every handy man, home-owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith.

53 Easy Illustrated Lessons

Low Price! Satisfaction guaranteed or money back. Full price is only $3.95 postpaid.

practical RADIO servicing



SELF-INSTRUCTION COURSE

Teaches you the **practical** side of radio.. repair, adjustment, operation, alteration, trouble-shooting. No previous knowledge necessary. Large clear illustrations, diagrams, charts, etc. **● INTERESTING STEADY WORK!** Set up a radio repair shop of your own—or prepare for booming industrial electronics. This useful, how-to-do-it course brings you all the fundamentals, including mathematics, review questions, problems, answers. Strictly up-to-date. Low price. **Only $3.95 postpaid. Mail no-risk coupon below to see this course on money-back guarantee.**

NELSON HALL CO., Dept. 2L01,
1139 S. Wabash Ave., Chicago 5.

Mail coupon below with payment and we ship fully postpaid on satisfaction-or-refund guarantee. You are sure to be amazed with these up-to-date self-instruction courses in handy book form.

CUT-RATE ORDER COUPON

NELSON-HALL CO., Dept. 2L01, 1139 S. Wabash Ave., Chicago 5.

Please send me the items I have checked below. If I am not satisfied I can return for refund.

( ) Success **$1.00**
( ) Short-Cut Mathematics **$1.00**
( ) Watch & Clock Repairing **$4.95**
( ) Locksmithing & Key Making **$3.95**
( ) Practical Radio Servicing **$3.95**

( ) I enclose $. . . . . in full payment. Ship entirely postpaid.
( ) Send COD for $. . . . . plus postage and COD fees.

NAME. . . . . .
ADDRESS. . . . . .
CITY. . . . . STATE. . . . . .

Copyrighted material

a small investment will establish you in . . .

Your OWN Business

Write For FREE Booklet

We are NOW enlarging our organization of U.S.A. and Canadian DURACLEAN dealers, in territories still open. Here is an opportunity to **BE YOUR OWN BOSS . . .** to become financially independent with a business of your own! You become a fabric specialist, providing the proper cleaning and moth protection for upholstery and floor coverings You use the proven, successful methods of established dealers. Service is rendered right **in the home,** office or institution without removing furnishings.

Patented

DURACLEAN Service was established **17 years ago** as an improved method for cleaning and revitalizing rugs and furniture. No brush or machine rubbing, soaking or shrinking. No inconvenience for the customer.

DURAPROOF makes fabrics and rugs **repellent** to moths, carpet beetles and mildew.

These services have a waiting market . . . a big repeat business. Write today! A letter and 16 page illustrated booklet will explain everything.

- **No Overhead Expense**
- **No Shop Necessary**
- **No Experience Needed**
- **You Learn Quickly, Easily**
- **Short Hours . . . Large Profits**
- **Service Nationally Advertised**

Don't delay! Territories are limited. Remember, just a moderate payment, easy terms, and the opportunity to become financially independent in **YOUR OWN BUSINESS!**

DURACLEAN CO., 18-N St., Deerfield, Illinois

LEARN TO WRITE

BE AN EXPERT PENMAN — NO TEACHER NECESSARY

RIGHT in your own home you can learn to write a most beautiful hand in an amazingly short time. New, simplified method. It is simply astounding how quickly you can master this new idea in becoming an expert penman. Your friends will be amazed when they see your artistic penmanship. Method originated by J. D. Rice, who for forty-two years was head of Penmanship Dept., Chillicothe, Mo., Business College. Contains same type material as expensive courses yet costs you only $2.95 postpaid, complete with special pens for shaded writing. Send for your course RIGHT NOW. Money back if not satisfied.

EDUCATIONAL PUBLISHERS

Dept. S-102 7241 Madison St. Kansas City 5, Mo.

STOP CHANGING MOTOR OIL!

End this needless waste and expense forever with . . . RECLAIMO

Today's Most Advanced Oil Re-Refining Filter!

Continuously cleans and **RE-REFINES** motor oil as you drive (by utilizing motor heat)—keeps oil in high grade lubricating quality at all times—reduces motor wear to an absolute minimum! Proves conclusively that **"Oil Does Not Wear Out Mechanically"** as stated in **U. S. Bureau of Standards. (Bulletin 86.)**

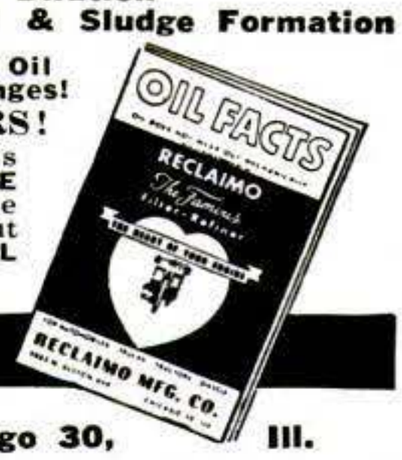
"RECLAIMO"

REMOVES SOLIDS (by filtration)
REMOVES WATER (by distillation)
PREVENTS Excess Fuel Dilution
PREVENTS Acid & Sludge Formation

MAINTAINS Stable Viscosity **ELIMINATES** All Oil Changes!

CAR—TRUCK—TRACTOR OWNERS!

You'll want to know more about Reclaimo's Oil, Motor and Money Saving Features. **FREE 40-PAGE BOOK "OIL FACTS"** gives you the complete "Reclaimo" story plus details about our **NEW 90-DAY NO RISK—NO COST TRIAL OFFER! Write for your copy today!**



RECLAIMO MFG. CO.

5083 Elston Ave., Dept. 59, Chicago 30, Ill.

AAF-B-3 FLYING JACKET

Leather, sheepskin lined, zipper front, reclaimed **$16.95** for reissue, like new. The perfect coat for all outdoor sports and outdoor work. Takes the toughest wear. It's warm as toast. All sizes. Army combat field jacket $3.95. All merchandise reconditioned. Sent C.O.D. Free catalogue of G.I. work clothing.

SURPLUS MERCHANDISE DEALERS, Dept. PS
1214 Broadway New York, N. Y.

AMAZING MYSTERY BUTTON

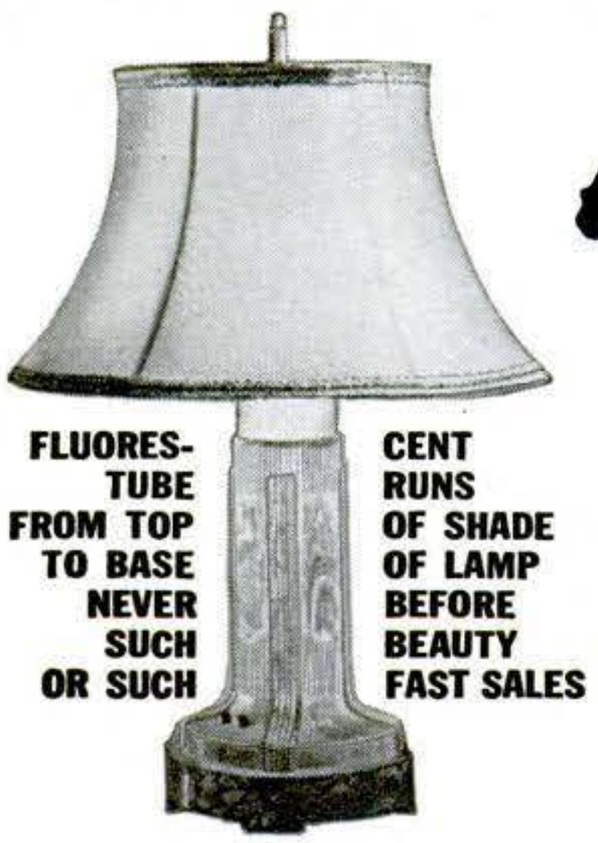
Startles Everybody. With this *Electronic Button* you can make your own Telephone—Amplifier—Dectectiphone. Attach this button to piece of cardboard—transmit conversation to another room. Music also transmitted to distant places. Most interesting electrical apparatus ever discovered. Enables you to perform hundreds of experiments. So tiny it can be concealed in dozens of places. A Pre-War Product. Electronic Button including 5000 word instruction booklet with 50 illustrated experiments, postpaid, only..... **$1.00**

ELECTRONIC PRODUCTS COMPANY, SAINT CHARLES 2, ILL.

ARC WELDER

BUILD YOUR OWN!

Light or heavy. No rewinding. 16 Heats. Use old auto generator coils. Complete plans and catalog, 35c. **LEJAY MFG. CO., 3323 LeJay Bldg., Minneapolis 8, Minn.**



For the First Time—

Agents FLUORESCENT All-Lite TABLE LAMP!

FIRST to utilize the exclusive feature of UPRIGHT fluorescent illumination, the ALL-LITE gives off a soft, even distribution of light without glare—from shade top to bottom of base.

Selling like mad. Men order sample, show it and reorder in gross lots. Instant appeal. Plug it in and watch them buy. Comes complete with tube and plastic shade.

FREE Send name for SAMPLE OFFER

DON'T send a penny. Sample offer is free. Rush name for selling outfit and make money from the day it arrives. We will show you how to sell to hundreds of homes, restaurants and public places and to stores by the dozens for resale. Also immediate delivery on standard fluorescent fixtures. Get going with the MAXILUME line. It's a winner for others—it can bring big, fast profits to you. Rush name on penny postcard.

MAXILUME COMPANY 125 W. HUBBARD ST., Dept. 911 CHICAGO 10, ILLINOIS

Copyrighted material

Best Boat Buy— $35

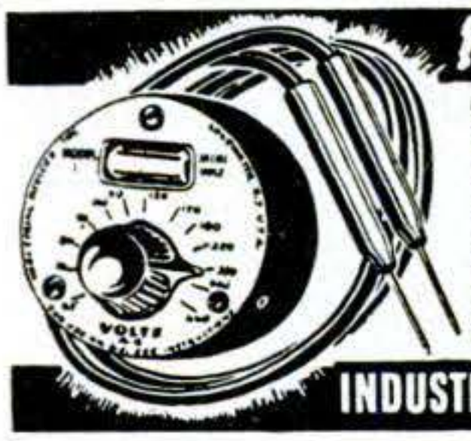
Assemble it Yourself!

The Hagerty SEA SHELL is a complete kit of precision cut wood and waterproof plywood parts. Write for illustrated folder today.

*REG. U.S. PAT. OFF.

HAGERTY
Cohasset, Mass.

FLASH THAT VOLTAGE



Turn that knob. Extinguish the neon glow. Instantly read voltage right off dial. MINI-VOLT measures 65 to 660 v. AC. Also DC. Tells whether AC or DC. Virtually burnout-proof. Guaranteed for 10,000 hours' operation. Bakelite case. 12" flexible test leads and test prods. A "must" in electrical and radio work. Model 400B only $2.50 postpaid!

INDUSTRIAL DEVICES, INC., EDGEWATER, N.J.

DUAL TAIL PIPE EXTENSION

FOR YOUR CAR. DEEP TONE, $2.95

PRODUCED BY 2½ IN. OUTLETS

Chrome Plated -- Fits All Cars

Postage Free on Money Order, Check or Cash

PAT. PEND. **LYONS PRODUCTS Co. 2319 Ridgeley Dr. Los Angeles 16, Cal.**

New Sensational FREE BOOKLET

7" TELEVISION KIT

High Performance, Low Cost Television is here. Easily assembled.
Complete kit ready to assemble **including leatherette cabinet.** In Mahogany..... **$159.50**
Walnut or Birch Cabinet.....**$174.50.**
Dumont 7" cathode ray tube, new advanced true FM sound, non-flicker pictures. Send C.O.D. F.O.B. $25 deposit required. Parts guaranteed unconditionally 3 months. **Assembled Ready to Play, $205.** Now Available New 10" Kit complete in every detail. With Panel $229.50. With Cabinet $263.50.

Distributors for Dynamic Television Assoc., Inc.

KENRAD TELEVISION CO., 509 5th Avenue, New York 17, N.Y.

HAVE YOUR OWN BUSINESS!

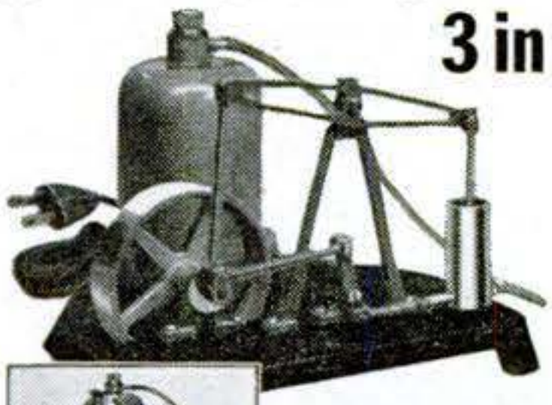
Operate pleasant, profitable Silk Screen Printing Shop. NO experience needed. Work at home in spare room or basement. Big demand! Large profits! Few dollars starts you. Start small, grow big. Real future possibilities! Eye-opening literature FREE.

W. E. WOLFF CO., 817-A High St., Anderson, Indiana

A Wonderful Gift -- Easy to Assemble

3 in 1 STEAM ENGINE

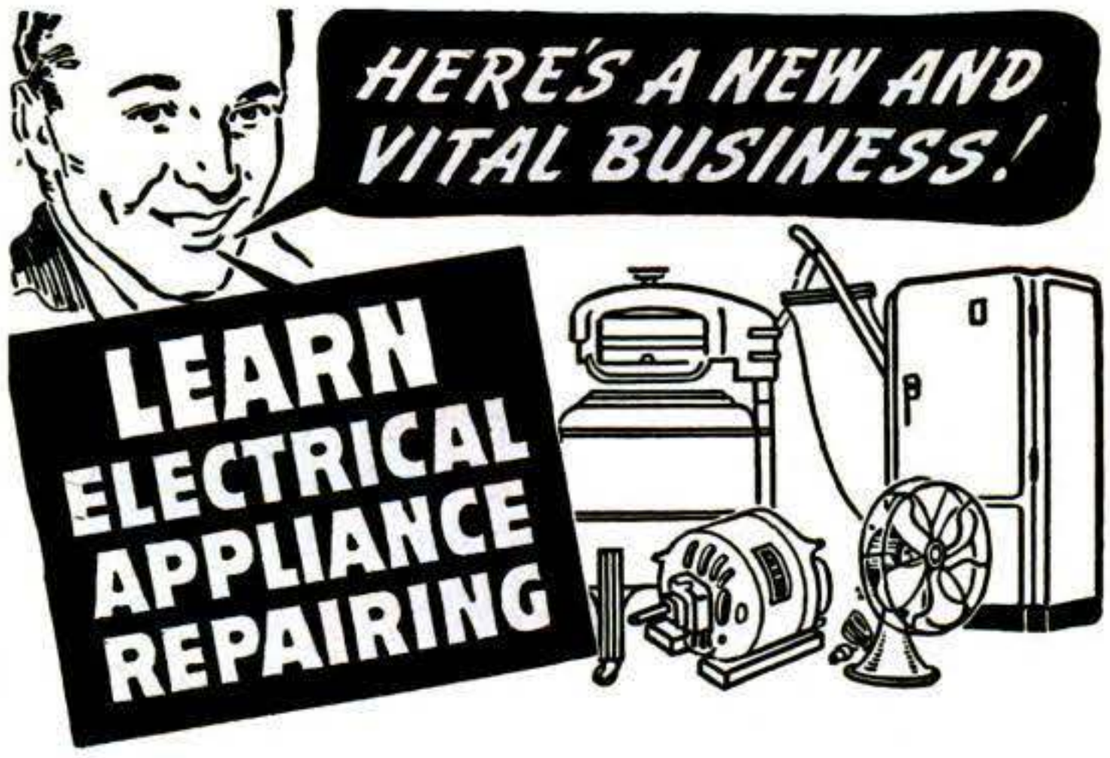
with electric-heat safety boiler



Here's the most fascinating father-and-son toy of 1947! A real steam engine that runs like a whiz! Available either set up, or as a knock-down kit. Either way, its 99 precision parts can be assembled into 3 different engines, as shown. A real deal for safe, educational fun. Shipped postpaid. Assembled as a walking-beam model—**$9.95.** Knocked down—**$8.95.**

Send check or money order. Or $1 deposit on CODs. Money back if not delighted.

YOUTHCRAFT, Dept. B 333 N. Michigan, Chicago 11, Ill.



Offers Big Money —Independence

If now employed, start your home appliance repair business NOW in your spare time and be set with a business of your own no matter what happens. Operate from your garage, basement, kitchen, vacant store, etc. Work as many hours as you wish—the home appliance repairman is his own boss. It is a profitable occupation, for on many types of repairs it is not unusual for a repairman to charge on the basis of $5.00 to $6.00 per hour! Remember, there are millions of electrical appliances in this country. Appliances such as refrigerators, irons, sewing machines, vacuum cleaners, heaters, toasters, washing machines, motors, etc. To replace them is mighty expensive. That is why the Electrical Appliance Repair Business offers the trained man unlimited earning possibilities.

YOU CAN QUALIFY

All you need to become a successful electrical appliance repairman is ambition plus a little training at home in your spare time. If you are mechanically inclined—that is to say—can hold and use tools, our profusely illustrated course written in simple, easy to understand language will prepare you for the years to come. It does not matter if you have not had a great deal of schooling or have had no previous training along these lines. WE WILL TEACH YOU. Age is no barrier—nor any minor physical handicap.

WE TEACH YOU

Profusely illustrated with photographs and simple drawings we show you what troubles to look for and how to make each repair on an electrical appliance. We give you a good sound working knowledge of electricity, and how to do welding, nickel plating, etc. Our course shows you how to solicit business and keep it coming to you. Not a theory course but an honest to godness course written by and used by repairmen the country over. Price of course is so low that the savings on your own household appliance repairs will quickly pay for it. Why work for others at the wages they want to pay you? Learn a good trade and operate your own business and determine how long you work each day and the amount of money you

Mail Coupon Today

CHRISTY SUPPLY CO.
2835 N. Central Ave., Dept. D-5801
Chicago 34, Illinois

Please send me free illustrated literature about America's Fastest Growing Industry—ELECTRICAL APPLIANCE REPAIRING.

Name.....

Address.....

City.....State.....

Copyrighted material

BAD SKIN?

Pimples, Blackheads and Other Externally Caused Blemishes...

Try Skin Doctor's Amazingly Simple Directions And Be Thrilled With The Difference—Often

CLEARED IN ONE SHORT WEEK

Don't squeeze pimples and blackheads to get rid of them! You may only aggravate your condition and make it worse. Besides leaving unsightly, embarrassing blemishes.

TRY DOCTOR'S SUGGESTION FOR JUST ONE WEEK

Handsome male screen stars don't risk marred skin, blotches and blemishes. They realize that a healthy, attractive complexion depends on proper *pore-deep* cleansing. That incomplete and faulty methods of cleaning can cause more unhappiness than so-called "bad skin."

And screen stars weren't born with different skin than yours!

EASY AS WASHING YOUR FACE

It's true. All you do is use VIDERM SKIN CLEANSER when you wash your face. Rub the rich lather on your face, then wash off. Apply a little VIDERM MEDICATED SKIN CREAM, and that's all there is to it!

Specks of imbedded dirt and irritating grime are quickly washed away. They dissolve and disappear, leaving your skin clean, clear, smooth and attractive. *You'll notice the difference on your first date.*

PERFECT FOR AFTER SHAVING

This effective treatment, used after shaving, helps heal tiny nicks and cuts, relieves razor-burn and smarting. Besides conditioning the skin and toning the surface appearance.

Just mail your name and address to Betty Memphis, care of the New York Skin Laboratory, 206 Division Street, Dept. 311, New York 2, N. Y. By return mail you will receive the doctor's directions, and both jars, packed in a safety-sealed carton. On delivery, pay two dollars plus postage. If you wish, you can save the postage fee by mailing the two dollars with your letter. If you are in any way dissatisfied, your money will be cheerfully refunded. To give you an idea of how fully tested and proven the Viderm double treatment is, it may interest you to know that, up to this month, over two hundred and twelve thousand women have ordered it on my recommendation. If you could only see the thousands of happy, grateful letters that have come to me as a result, you would know the joy this simple treatment can bring. And, think of it!—the treatment must work for *you,* or it doesn't cost you a cent.

NEW EASY WAY TO MAKE MONEY at HOME

YOUR COST ONLY 5c YOU GET $5.00, FULL OR SPARE TIME.

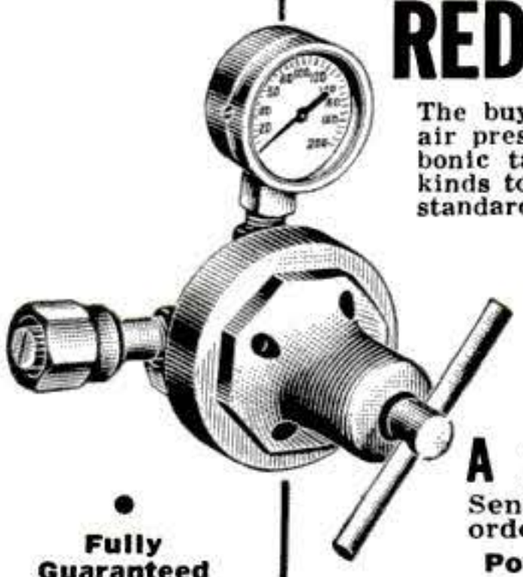
It's easy to Bronze Baby Shoes. Business still in infancy. Get in on ground floor and skim cream of profit from rich and never-ending market. No experience needed. **Learn in one week.** Income up to $1,000 a month full time—$50 to **$75 weekly in spare time.** We furnish complete kit and full instructions. So easy to understand that a 12 year old can become **expert.**

FREE FACTS. Write today. Don't send a penny. Just name and address in letter or postcard. Be the first in your territory to reap rewards waiting. Costs only 5c to bronze shoes. Sell for $5.00! This is too good to miss. Get facts today. Write to

KIKTAVI COMPANY, Dept. 12
8620 So. Ruthelen **Los Angeles 44, California**

A GREAT SURPLUS BARGAIN

REDUCING GAUGE



The buy of a lifetime in a standard make air pressure regulator. Used on liquid carbonic tanks and air pressure tanks of all kinds to regulate the pressure. Fitted with standard ½ inch pipe thread. Dial calibrated 0 to 200 lbs. Made by U.S. Gauge, Air Reduction Co., Walter Kiddie – all famous makers. Used by artists for air brush work, sign painters, retouchers, etc. Used by soda fountains and taverns. All units are brand new. Satisfaction guaranteed.

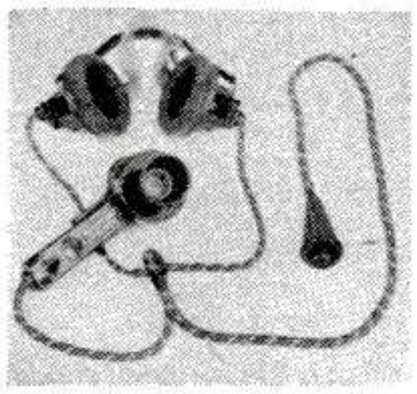
A $15.00 Value $5.95

Send check or money order. Ship same day. **Postpaid in U.S.A.**

- **Fully Guaranteed**
- **All Brand New and in Perfect Condition**

GROBAN SUPPLY CO.
1522 So. Michigan Ave., (Dept. PS11) Chicago, Ill.

ARMY RADIO PHONES



They're Weather — Water and Shock Proof———

When we say they are made to Army specifications, that's enough assurance they must be of best quality. Use them for recording, for batteryless phone, for pocket size set loud speaker or talk through your radio set. We bought a good many of these Radio Phones, they are brand new, and cost a great deal more than you can get them for. A complete dynamic hand mike, 2 earphones, headband, cord set. A wonderful buy for only..... **$1.95**

SUPER SPECIAL CRYSTAL MICROPHONE CARTRIDGE. Dandy for replacement or make your own mike by placing into box. A tremendous value—Only..... **69c**

Send check or Money Order, FOB warehouse

LEEDS RADIO CO.
75 Vesey St. **Dept. PS11** **New York City 7**

WHEN KIDNEYS Work Too Often

Are you embarrassed and inconvenienced by too frequent elimination during the day or night? This symptom as well as Smarting Passages, Backache, Leg Pains, Nervousness, Rheumatic Pains and Swollen Ankles may be due to non-organic and non-systemic Kidney and Bladder troubles. In such cases the very first dose of the scientifically compounded medicine called **Cystex** usually goes to work right now helping you these 3 ways: 1. Helps nature remove irritating excess acids, poisonous wastes and certain germs. 2. This cleansing action helps nature alleviate many pains, aches, soreness and stiffness. 3. Helps reduce frequent night and day calls, thus promoting better sleep.

Get **Cystex** from your druggist today. Give it a fair trial as directed on package. Money back guaranteed unless **Cystex** satisfies you.

Copyrighted material

7 x 50 BINOCULARS

$48

Weight 39 oz.

Height 7 in.

These magnificent 7x50 prism binoculars have the brilliant luminosity, precise clarity, and wide, undistorted field of view obtainable only with a large glass. Because the 7x50 is the best glass available it is now the official choice of the Army, Navy, and Marine Corps. Why be satisfied with a smaller glass when you can have a fine 7x50 now at *less than 1/3 of the usual price.* Brand new and perfect. Lifetime construction. Ultra-precise optics that prompt users to remark, "The finest glass I have ever looked through." Sold with a guarantee of complete satisfaction or money refunded. Carrying case included. Price, only $48 plus 20% Federal tax. We pay the shipping cost. Immediate delivery.

BROWNSCOPE CO.

Dept. 11P, 24 West 45th St., New York 19, N. Y.

AXLE ASSEMBLIES

with a hundred uses

LIMITED OFFER • ORDER TODAY!

Complete as illustrated, 1½" square, 58" tread. With 6:00 x 16 recap tires **$52.50**

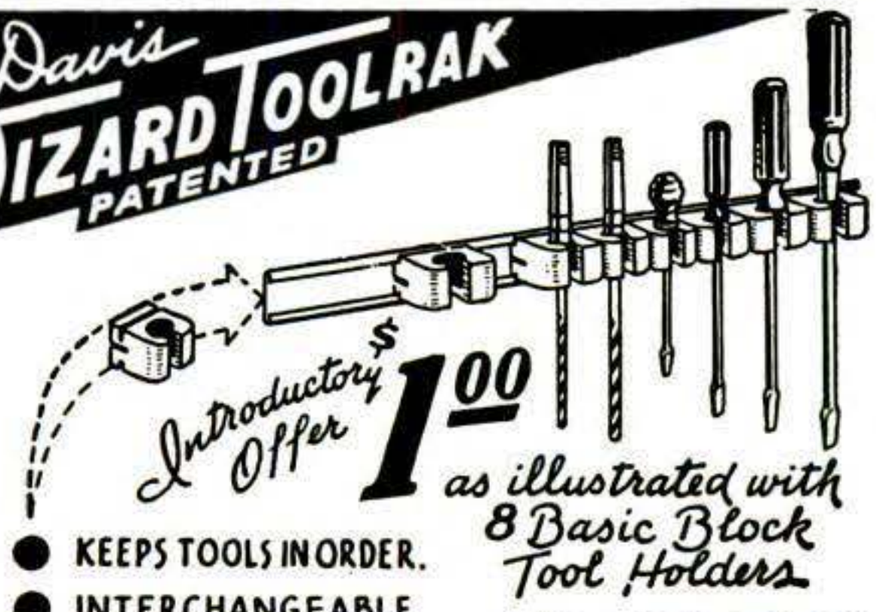
Without tires **$45.00**

• BULL DOG HITCHES—with tongue-ends for every need.

HAMMER BLOW TOOL COMPANY

DEPT. D-17, WAUSAU, WISCONSIN

The Davis **WIZARD TOOLRAK** PATENTED



Introductory Offer $1.00 *as illustrated with 8 Basic Block Tool Holders*

- KEEPS TOOLS IN ORDER.
- INTERCHANGEABLE HOLDERS MEAN TOOLS CAN BE ARRANGED IN ORDER DESIRED.
- SAVES SPACE · EFFORT.

• Your tools can now be arranged in the order you desire. Illustrated folder showing variety of wood block holders and aluminum back strips available is sent with each order.

DEALERS INQUIRIES WELCOMED

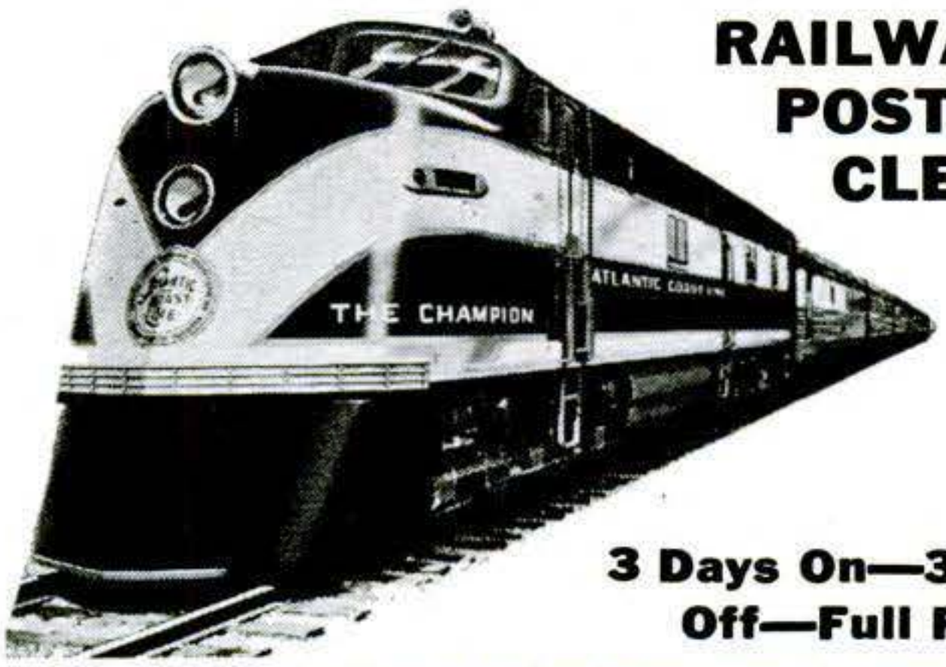
Vanco Products Inc. 222 E. CUCHARRAS COLORADO SPRGS. COLORADO

START
$1,756 to $3,021 YEAR

Prepare NOW for 1948 Examinations

Railway Postal Clerks

Railway Postal Clerks get $2,300 the first year of regular employment, being paid on the first and fifteenth of each month. ($95.84 each pay day.) Their pay is automatically increased yearly to $3,400 and $3,600 in larger organizations. Advance may be had to Chief Clerk at $5,400 a year. ($225.00 each pay day.) Men, 18 to 35.



Railway Postal Clerks on long runs usually work 3 days and have 3 days off duty or in the same proportion. During this off duty their pay continues just as though they were working. They travel on a pass when on business. When they grow old, they are retired with a pension.

City Mail Carriers, Post Office Clerks

Clerks and Carriers now get $2,100 the first year of regular employment and automatically increase $100 a year to $3,100. Open to men—women 18 to 50.

Patrol Inspectors

Men 21 to 35. Entrance salary $3,021 year. Appointments to positions along the nation's borders are made from this examination.

Many Other Positions

Many other positions are obtainable. Those wishing these positions should prepare at once.

Get Free List of Positions

Fill out the following coupon. Tear it off and mail it today—now, at once.

This small investment can result in your getting a big-paid government job.

FRANKLIN INSTITUTE, Dept. P81, Rochester 4, N. Y.

Rush to me, entirely free of charge (1) a full description of U. S. Government Jobs; (2) Free copy of illustrated 32-page book, "How to Get a U. S. Government Job"; (3) List of U. S. Governmen Jobs; (4) Tell me what to do to prepare for one.

Name .....

Address .....Vet. ?.....

Use This Coupon Before You Mislay It. Write or Print Plainly.

Copyrighted material

WAR SURPLUS AND HUNDREDS OF OTHER BARGAINS

HAND MICROPHONE

Top quality hand microphone with control button in handle. Highly sensitive. Has rubber covered cord and tel. plug. Fine for use on home recorders, public address systems, etc. Brand new—perfect. Shp. wgt. 2 lbs. **Stock No. 170.** Each . . **$1.95**

MESS KITS

Regulation two-piece Army Mess Kits with folding handle. Used, but perfect. Weight 2 lbs. **No. A116**—Ea.. **69c**

CANTEENS

Reg. U. S. issue canteens. Plastic screw top chained to body. Slightly used but perfect. Wgt. 1 lb.
117—Metal
118—Plastic—Ea. **69c**

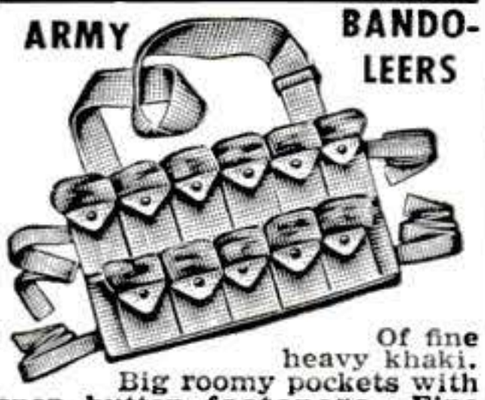
CANTEEN CUPS

All metal. Folding handle. Wgt. 1 lb. **No. A120**—Each.....**25c**

CANTEEN COVERS

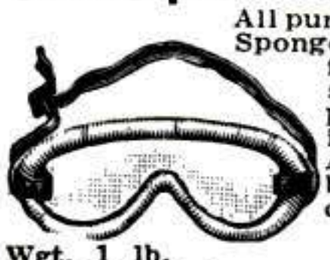
Heavy canvas. Button fastener.
New **No. 530**—Each.....**69c**
Used **No. 119**—Each.....**35c**

ARMY BANDOLEERS



Of fine heavy khaki. Big roomy pockets with snap button fasteners. Fine for hunters, campers, boy scouts, etc., also for shop work in carrying small parts, etc. Material alone is worth this price. Shp. wt. 1 lb.
11 Pocket Type No. **129** Each **49c** | 5 Pocket Type No. **128** Each **29c**

Shatterproof Goggles



All purpose type. Sponge rubber frame. Red shatterproof flexible lens. Adj. head band. With case. New. Wgt. 1 lb.
No. 139—Each **39c**

BAYONET BLADE

Fine forged steel. Ground but not polished. May be made into throwing or hunting knife or spear. Blade 6¾x⅞ inches, 11¾ inches overall. Will take and hold a fine edge. Shp. wgt. 1 lb.
No. 664-R—Each..... **49c**

STOP WATCH

Genuine Elgin 15 Jewel movement. Ideal for split second timing in racing, sports, time study, etc. Full sweep split second hand graduated in 1/10th seconds. Stem wind, start, stop and reset. Used but guaranteed perfect. A splendid value. Shp. wgt. 1 lb.
No. 200—Each..... **$9.95**

POPULAR RECORD ASSORTMENT

Fifty records of modern dance, race, blues and hillbilly selections. No two alike. Famous name bands and artists included. Used in juke boxes, but guar. perfect. Shipped exp. collect only—no exchanges or refunds. Wgt. 28 lbs.
No. A303—50 records **$9.64**

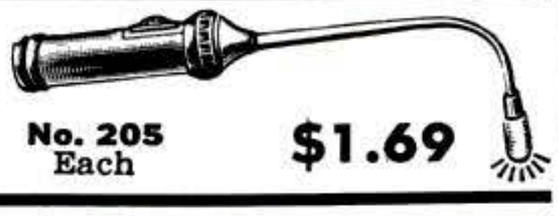
No A300—25 Records. All Dance. Wgt. 14 lbs..... **$4.88**

No. A301 — 25 Records. Hillbilly, Race and Blues. Wgt. 14 lbs. Set... **$4.88**

No. 302—25 Records. All Hillbilly numbers. Wgt. 14 lbs. Set... **$4.88**

FLEX. NECK FLASH LIGHT

Ideal trouble shooter's flash light. Flexible neck lets you direct light around corners and inaccessible spots. Brand new! Plastic case with BX type neck. Uses 2 standard flash light batteries. (Less batteries) Shp. wgt. 2 lbs.



No. 205 Each **$1.69**

HORSEHIDE JACKET

The leather coat buy of the year! Brand new Army Air Force Type A2 with full length zipper, shoulder straps, knitted waist band and wrists and full satin lining. Finest horsehide — finest tailoring. Order by chest size. Shp. wt. 5 lbs. **No.201** **$19.95**

PUP TENTS

Regulation Army Pup Tents of durable, brown canvas. Used, but in good condition. Fine for campers, outdoorsmen, boy scouts, etc. Wgt. 8 lbs. **A100**—Tent only.... **$3.95**
A110—Tent, new **$7.95**
A101—Ropes, wooden poles and stakes for above. Per set.....**$1.00**

Plastic 8 oz. Flask

For hunters, scouts, fishermen. Waterproof and transparent. Use it for liquids. Use it for matches, flies, bait, etc. Has screw cap top for liquids, plus full open top. Size 5½ x 4⅛ x 1⅛ ins. Has hundreds of other uses. Wgt. 1 lb. **No. A347.** Each **29c**

27 LENSES, ALL NEW, PERFECT.

For experimental work in optics. Consists of 27 precision ground and polished prisms and lens elements in assorted diameters and focal lengths. Big variety, positive, negatives, etc. Actual value over $100.00. **A519**—27 PIECES **$7.95**

7 LB. EXPERIMENTER PARTS ASSORT. KIT

A "gold mine" for the radio serviceman. Hundreds of valuable radio parts, new radar and electronic parts and subassemblies, coils, resistors, trimming condensers—worth many times this low price. **A130R**—7 lbs.... **$1.79**

RAIN SUITS

New 2 piece rain suits. Of durable wear resisting water and wind repellent OD fabric. Bib style pants, zipper fly. Jacket has parka attached. Guaranteed 100% weatherproof. Small, medium and large sizes. Shp. wgt. 3 lbs. **No. R549.** Each..... **$4.95**

STIRRUP PUMP

Works with any pail or bucket. Shoots a high pressure stream up to 30 feet. Use it for spraying garden and trees, for whitewashing, fire fighting, drainage, etc. Complete with 10 foot flexible hose. All brand new. Regular $3.80 value. **No. 244**— Each..... **$1.49**

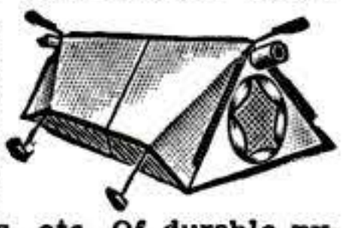
FISHING REEL

Exceptional quality for this low price. Has rugged one piece frame. Ratchet drag. Single action. Attractive catalin handles. Brass bearings for smooth operation. Full 100 yard line capacity. Brand new! A splendid value at this low price. **No. F412,** Each.. **98c**

50 LENSES SEMI-FINISHED

Lenses similar to A519 but not polished. All are blanked and formed ready for polishing. Negatives, positives and prisms in Crown and Flint glass. Worth many times this low price. **A520-50-** LENSES, ONLY.... **$1.95**

2 Man Mountain Tent



Regulation Army type two man mountain tent, complete with poles, guy ropes, etc. Of durable nylon with reinforced seams. Ideal for outdoorsmen, campers, etc. Shp. wgt. 10 lbs. A splendid value. **Stock No. 202**—Each.... **$9.95**

Officers Watch Compass

Brand new gov't. surplus. Army-Navy model. Single jewel mounted needle. Silver colored dial. A splendid value. Shp. wgt. 1 lb. **A174**—Each.... **98c**

BERNARD WIRE PLIERS

Parallel acting jaws. Wire cutter at top. Brand new. Wgt. 2 lbs. **No. 168.** Ea. **$1.29**

WOOL SLEEPING BAG

G.I. type 100% wool with 30 inch Talon zipper. Used but renovated for reissue. Shp. wgt. 3 lbs. **No. 165.** Each **$3.95**

FLIGHT BOOTS

Gov't. type A-6. For cold weather fishing, hunting, trapping, driving, etc. Genuine shearling full fur lining. Rubber outers. Zipper closing. Heavy soles. Used but reconditioned like new. Give shoe size. Wgt. 4 lbs. **No. 396** Pair... **$5.95**

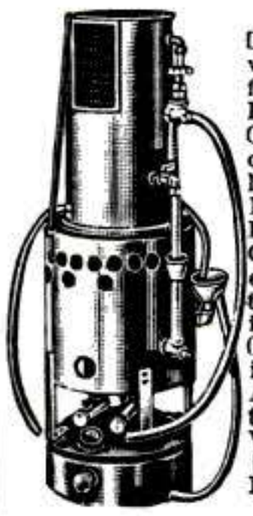
AMMUNITION BOX

Used for 50mm ammunition. Heavy, all metal design with latching top and folding handle. Provides safe, fireproof storage for valuables, etc. Measures 12x6x7½ inches. Used but in new condition. Shp. Wgt. 8 lbs. **No. 338**—Each.... **79c**

RUBBER SUIT

Fits over your regular clothes and shoes. Can be cut apart for waist high waders, hip high or knee high boots, also arm length rubber gloves. Heavy gum rubber over fabric. Fine for those who work in the water, commercial fishermen, sewer diggers, etc. All brand new! Wgt. 14 lbs. **No. 183**—Each.....**$4.95**

STILLS



Distill your own water with one of these fine portable stills. Purchased from the Gov't. Completely self contained. Has 1 gallon capacity; output 1½ gal. per hour. Fitted with genuine Coleman double burner stove. Operates 5 to 7 hrs. on one filling. Heat output 20,000 BTU's. Stove alone is worth this price. All new and guaranteed. Instr. included. Weight 109 lbs.
No. 206 Each.... **$59.50**

ORDER DIRECT FROM THIS AD

Values galore! Hundreds of hard-to-find items for home, shop and outdoors. Make remittances by money-order, bank draft or personal check. Send 25% deposit on C.O.D. orders. No C.O.D.'s on orders for less than $5.00. Include sufficient postage on parcel-post orders—any overage will be promptly refunded. All quotations F.O.B. Chicago. Used items and materials are guaranteed serviceable and as described. Your money back if not more than satisfied.

Big Illustrated Catalog Free

WRITE FOR YOUR COPY TODAY

STARK'S

Dept. PS1147
509 S. State St.
CHICAGO 5, ILL.

AVIATORS FLIGHT PANTS

For cold weather wear in working, skiing, hiking, driving, etc. Made of heavy twill material with heavy fur-like alpaca lining. Pockets at knees, thigh, hips and back. Suspenders included. Large, medium and small sizes. All brand new. Orig. cost to gov't. approx. $22.50. Shipping weight 5 lbs.
No. 371—Each **$4.88**

CAMERA TRIPOD

Purchased from Gov't. Used but perfect. For cameras up to 8x10 inches. Folds to 32 inches, extends to 58 inches. Needs adapter to mount camera. Wgt. 14 lbs. **Stock No. 190.** Ea. **$4.95**

Copyrighted material

12 AUTOMOBILES

CLYMERTONE Twin Muffler Sets, beautiful sound, complete with necessary welded pipes, E-Z installation. Ford V-8, $20.00. Chevrolet set with split manifolds, $37.50. Specify car model. Clymer, Dept. B-114, 2125 W. Pico, Los Angeles 6, Calif.

RACING Car performance for all cars. Complete specifications, $1.00. Increase power, speed. Special "Custom-built" equipment. Free literature. Write Lee Motorcraft, 1412-B Great Northern Bldg., Chicago 4, Ill.

"BURN Water"—Quickly convert any automobile (trucks, tractors, private-planes, motorcycles) to amazing Water Injection (like late war planes)—only $1.00! Saves gas, greatly increases power, more pickup, speed, cooler, sm-o-o-ther motor. Up to 33 miles per gallon! Easily assemble your own Injector. Copyrighted Installation Manual, including comprehensive Diagrams, Detailed Instructions, etc.—$1.00 complete. Newhouse Industries, 5941-Y Hereford, Los Angeles 22, Calif.

AUTO racing, magazine subscriptions. Pacific Speedway News, $6.00 yearly. National Speed Sport, $4.00. Illustrated Speedway News, $4.00. All give complete data midget, big car race results. Sample copy each 50c. Specify publication wanted. Clymer, Dept. B-112, 2125 W. Pico, Los Angeles 6, Calif.

FROM Speedway to Roadway! Track-proved Hi-Speed Heads and Manifolds now available for passenger cars! No special tools needed! Increase horsepower 25%! Astounding Getaway! Free illustrated Catalog. Speedsport, 5747B Waveland, Chicago 34.

AUTOMOBILE Racing Book. Fifth Edition—Revised. Tells how to build dirt tracks bodies, frames, engines. Records, superchargers, rules, formulas, plans, stock conversions, roadster racing, fast Fords. $1.00 postpaid; $1.15 C.O.D. Ray Kuns, Department 274, Madisonville, Cincinnati, Ohio.

AUTOMOBILE Racing Sixth Edition. 100 illustrations. Working drawings with building instructions for Ford-60 midget, California roadster, Offenhauser racer. Details on racer parts. Sample entrance blank. World's record 158.5 M.P.H. rear engine four-wheel drive car. Interesting information for fans, drivers, mechanics. $2.00 postpaid; $2.25 C.O.D. Ray Kuns, Department 62, Cincinnati 27, Ohio.

CLYMER'S Historical Motor Scrapbook No. 4, latest Clymer book old cars, motorcycles. Postpaid $1.50; De Luxe Edition, $2.50. Clymer, Dept. B-118, 2125 W. Pico, Los Angeles 6, Calif.

BUILD automatic clutch, scooters, midget autos, tractors, shop machines. Catalog Free. Nichols Equipment Co., Dept. 412, Purvis, Miss.

CUSTOMIZE Your automobile! Revised, enlarged book, latest restyling, complete, sharp. 50 photographs! $1 pp. Post Publications, Box 723-SC, Arcadia, California.

USED-CAR Buyer's Handbook. Save dollars, grief. Photographs, dealers' tricks, complete tests. $1 pp. Post Publications, Box 723-TC, Arcadia, California.

KAISER-FRAZER. Floyd Clymer's new book (no connection with K-F factory) gives complete uncensored, impartial report 3000-mile test run with Kaiser. 100 photographs; describes new Pike's Peak closed car record, Kansas City-Denver record run, economy test. Opinions of 3000 K-F owners. Complete breakdown of equipment, units used. Read good and bad about K-F cars. No punches pulled. $1.50 postpaid. De Luxe edition $2.50. Clymer, Dept. B-111, 2125 W. Pico, Los Angeles 6, Calif.

CUSTOM-Car Photograph Album. Fascinating automobile style classics! Coachcraft, Summers, independents, photo-packed! $1 pp. Post Publications, Box 723-AC, Arcadia, California.

HOLLYWOOD Hot-Rod Manual; plans, photos, instructions, fast Fords, $1.50 P.P. Racing parts list, 25c. P. P., Hollywood Hot-Rod, Box 9626S, Los Feliz Sta., Hollywood 27, Calif.

HOTROD and fast stock car equipment. Heads, manifolds, camshafts, etc. List 25c. California mufflers for all cars. V8 duals $23.00. Chevrolet duals $33.00 and $37.50. V8 or Chevrolet hopup instructions $1.00. Specify. Alden Motors, Oakland City, Ind.

AUTO Repair Manuals, by Victor Page. Complete non-technical data all mechanical features, operation, repair. Ford V-8 cars, trucks, 823 pages, 369 illustrations. $3.50 postpaid. Chevrolet Six and truck, 896 pages, 363 illustrations. $3.50 postpaid. Clymer, Dept. FC-3, 2125 W. Pico, Los Angeles 6, Calif.

SEE our ad under Motorcycles for midget car bargains. Midget Motors Directory, Athens, Ohio.

1947 INDIANAPOLIS "500" Race History Book. Complete details every car, driver competing. 100 photos, charts, drawings. $1.00 postpaid. Large complete Indianapolis Race History Book. 352 pages. 1100 illustrations, all data 1909-1946 inclusive. Postpaid $3.50; De Luxe Edition Fabrikoid binding, gold lettering, $5.00. Clymer, Dept. B-110, 2125 W. Pico, Los Angeles 6, Calif.

HIGH Compression Heads. V-8. More speed, acceleration, power. Offenhauser or Edlebrock $75.00 complete set. Dual manifolds complete with throttle kit, fuel lines. Edlebrock $49.00, Offenhauser $55.00. Give make, model V-8. Catalog 10c. Clymer Motors, Dept. B-113, 2125 W. Pico, Los Angeles 6, Calif.

"BUILD speedy Midget Track Racer from castoff parts! Plans, specifications, construction information, $1.00. Motor Supply, Box CS-1682, Toledo, Ohio."

PEP Up your Battery with Pep Up. Aid to better performance. Only 50c postpaid. Agents Wanted. Write Wm. H. Tuers Enterprises, P. O. Box 7, Universal City, Calif.

DUALTONE Chrystalline packed, California mufflers, single or twin for all automobiles. Carburetor Velocity Stacks. Compression cylinder heads. Dual manifolds. Large double or single chromed tailpipe extensions. Chromed Station Wagon Stacks. Fender Skirts. Request Catalogue. Dualtone Mufflers, 2636B India Street, San Diego 1, Calif.

PHOTOGRAPHS, World's Finest Automobiles. List 10c. Box 1028, Minneapolis, Minnesota.

BRITISH Sports Cars. New Book. 96 makes described. Fine illustrations, specifications. $3.00 postpaid. Clymer, Dept. B-117, 2125 W. Pico, Los Angeles 6, Calif.

"1948 CUSTOM Styling" Manual. Easily make car look Hollywoodized, Custom-built. Ultra-Beautiful! New simplified customizing, restyling, streamlining methods. Instructions, photographs. Plans for accessories, refinishing, mufflers, model changes —for old and new cars $2. Almquist Engineering, Box 660-B, Brooklyn 1.

"STREAMLINED Three-Wheeled Car"—Build your own for $75! Speedy, two passenger roadster. Unbelievably simple construction. Racer body—small motor. Also, two passenger "Motor-Ette" plans. Complete Instructions, diagrams—for both $1.98. EA Engineering, Box 660-B, Brooklyn 1.

SPEED & Mileage Manual — Obtain greater speed, mileage, racing performance from any automobile! Includes simplified methods, speed tuning, gas saving secrets. Instructions on building economizers, speed equipment, duals, mufflers, superchargers, racing fuels, fast conversions, "Hot-Rods", Part Lists. $1.98. Almquist Engineering, Box 660-B, Brooklyn 1.

NOW available after 2 years of postwar engineering. World's most practical midget auto. Suitable for both highway driving and small track use. Acclaimed finest by many small car technicians—Four precision models from which to choose. Available ready-to-run or in kit form. Send 25c for illustrated literature. Saxon Midget Engineering, Dept. S., Sacramento, California.

MAKE your Ford fast! Complete details, photographs. How to construct 120 mph Hotrod. $1 postpaid. California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

INSTALL V-8 engine in your Model A for extreme acceleration, more top speed, smoother performance. Complete details, photographs. $1 Postpaid. A-V-8, Box L-2, Eaglerock, Los Angeles 41, Calif.

MAKE Your Model "A" do 100 mph. Lightning acceleration, breath-taking top speed. Complete details. Photographs. $1 Postpaid. Four Barrel, Box L-2, Eaglerock, Los Angeles 41, Calif.

WATER Injection For your car. More power. Smoother performance. Wrench installs in half hour. $14.65 complete. Free booklet sent on request. Spee-Dee Products, 2409 South 10th Street, Tacoma 6, Wash.

CLYMER-LITE Aluminum pistons for Chevrolet. More speed, power, acceleration. Less vibration, heat. Complete with pin, rings. $5.00 each. Semi or finished. State size. Clymer, Dept. B-116, 2125 W. Pico, Los Angeles 6, Calif.

13 AUTO SUPPLIES & EQUIPMENT

1½ H P Neptune Outboard—Brand New $52.00—10% deposit required. Outboard Sales, 3419 Nashville Avenue, New Orleans, Louisiana.

HAVING Car Trouble? New, Used, guaranteed auto, truck parts save money. Transmission specialist. Describe needs; immediate reply. Victory, 2930ZJ No. Western, Chicago 18.

WELDING bodies, repairing fenders, pays good profits using Hobart's AC Arc Welder. Catalog Free. Write Hobart Welders, Box P-1172, Troy, Ohio.

MANIFOLD Whistle—imitates "Wolf Whistle", Siren, etc. Installed on any car manifold in fifteen minutes. Send $6.00 to Protecturod Company, 4033 Windsor #5, Youngstown 7, Ohio.

BURN water in your car. Costs less than gas, more power: Cleaner motor. Mail card for data on $17.50 Octa-Gane Water injecting Carburetor. Ralph A. Shade, 563 Lake Road, Webster, N. Y.

PLATING Outfits For Autoparts. Connect to a battery. No tanks used. Outfits furnished. Free particulars. Gunmetal Co., Ave. K, Decatur, Ill.

AUTO parts for all autos and trucks. Trans. motors, differentials, fenders, carburetors. Also Body Parts. Security Auto and Truck Parts, 1923-BP Grace, Chicago 13.

NEW 1947 Crosley Engines—$190.00 Exchange Largest stock of Crosley parts in the U. S. Witkin-Borshell Co., Inc., 217 S. La Brea Ave., Los Angeles 36, Calif.

NEED Auto Parts? We have them. New and Rebuilt. Prompt Shipment. Write Requirements. Save Money. Buy Direct. Factory Warehouse, Mechanics Auto Parts, 3807-BI North Ashland, Chicago 13.

WELDERS for all requirements. Free Catalog. Write Hobartweld, Box P-1173, Troy, Ohio.

WATER Injection Manual—Easily make own system (for less than $1.) "Vapor Injection" increases speed, power, acceleration—30% gas saving! Better performance! Eliminates ping, carbon. Reduces wear, sludge, oil pumping. Installation Instructions include "Hop-up Tips" $1.00. EA Engineering, Box 660-B, Brooklyn 1.

RECONDITION Engines & Cure Oil Pumping without overhaul! "Quick, easy, money saving procedure" includes Tuneup & Economy Tips for better performance! Valuable Manual $2. Almquist Engineering, Box 660-B, Brooklyn 1.

AUTO Glass, Shock Absorbers, Rubber Floor Mats at factory prices! State requirements for quotations. Shipment immediately. Cooper Auto Glass, 3137 Lawrence, Chicago 25, Illinois.

GASOLINE saving Vacuum Supercharger, uses gasoline motors waste. $12.50, self addressed stamped envelope for pamphlet. McDowell Co., 2000 NE. Union, Portland 12, Oregon.

CHROME grilles for all cars. Wagner Grille Co., Route 2, Bernville, Penna.

OIL Pumping Motors—Details. Mullner Co., Box 3102, St. Paul 1, Minn.

SPARK Plugs government surplus. No. 83 AC 18mm, M-5 Blue Crown 14mm 29c. Standard Brands reconditioned 20c each FOB. Carl's Supply Co., Box 6024, Kansas City, Mo.

14 AUTO TRAILERS

BUILD your own Trailer! Save Money! Have every feature you want! Plans for House, Sport, Camp and Utility trailers. Catalog describing 9 models 10c. (15c in Canada and overseas). Jim Dandy, Box 125-B, Wausau, Wisconsin.

TRAILERCOACHES — learn about all types—sports, living or travel. Approximately 100 pages monthly—magazine tells all. Special rate $1 the year in U.S., $1.50 to Canada, $2 Foreign. Trail-R-News, Box 431-C, Glendale, California.

ATTENTION Trailer Builders—Complete Chassis Assemblies including all steel frame, axles, springs, wheels, tires and tubes available for immediate delivery. Wausau Trailer Company, Box 351, Wausau, Wisc.

91 MOTORCYCLES, BICYCLES, SUPPLIES

"PROFESSIONAL Midget Racer, Motor-scooter, Midget Roadster, and Midget Motorcycle. Plans, specifications for all four contained in illustrated handbook, 25c. Big list bargain priced used motors, motorscooters, Servicycles, etc., included free! Midwest, 3839 Drummond, Toledo, Ohio."

WHEELS! Build wagons, scooters, mowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages, 4" to 16". Free list. Trulsen Mfg. Co., 811 E. 31, Kansas City, Mo.

Copyrighted material

WHEELS, Tires, Tubes for Motor Scooters, Midget Cars, Wheelbarrows, and Industrial equipment. All sizes. Bicycle Parts, accessories. Largest stock in United States. Send dime for list. Cycle Transport Company, 1241 S. Michigan Ave., Dept. C. Chicago 5, Illinois.

MOTOR Scooters, bicycle engines. 120 miles gallon. Dime for catalog. Clymer, Desk B-115, 2125 W. Pico, Los Angeles 6, Cal.

MIDGET Racer with three speed transmission $35; Briggs motorscooter $25; Three wheeled motorscooter $45; English motorcycle $100; gasoline motors $5 up; outboards $25 up; plenty brand new 2 horsepower motors in factory crates; plenty midget racers for highway use; over 6200 small balloon tires for motorscooters and small cars. (Mailorder only). Send 25c for Big War-Bargain catalogue Number Twenty-One, just out, listing the above and hundreds of other bargains in new and used motorscooters, motorcycles, midget cars, motors, transmissions, automatic clutches, parts, plans, etc. (35c by First Class mail.) Midget Motors Directory, Athens, Ohio.

"CUSHMAN motorscooter $15. Shaw bicycle motor $15. Harley-Davidson Motorcycle $35! Send 25c for bargain catalog #8, packed with money saving buys in motorscooters, motorbikes, midget cars, motors, wheels, tires and parts. Gail and Company, 538 Erie, Toledo, Ohio."

"BUILD America's lowest priced motorscooter speedster! Complete plans, specifications, $1.00. Big list bargain priced used motors, etc., included free! Motor Supply, Box 1682-CS, Toledo, Ohio."

"CUSHMAN Motorscooter $20 (includes motor and extra tires). Midget Racer $15! Send 25c for big Summer catalog #938, just printed, listing these and scores of other sensational bargains in motors, wheels, motorscooters, motorbikes, Servicycles, tires, etc. Associated, Box CS-1764, Toledo, Ohio."

WHEELS, Steel Disc rubber-tired for toys, wagons, scooters, etc. Sizes 5", 6", 7", 8", 10" available. United Wheels Mfg. Co., 11727 La Fayette Ave., Chicago 28, Ill.

MOTORCYCLE News—monthly. Yearly Subscription $1.00. Introductory copy 10c. Motorcycle News, 5424-B Sawyer, Chicago 25.

MOTORCYCLE, Parts, new and used. Harley, Indian, Henderson, Super-X. List 10c. Ballak, 811 N. 9th, St. Louis 1, Mo.

LARGE stock Indian parts. Expert motor rebuilding. New and rebuilt Chief Motorcycle, motors only. Indian Motorcycle Sales, Kansas City 1, Mo.

15 AVIATION

GIANT Glider Kites. Double, 14x10 ft. Lifts 100 lbs., tows car, etc. Cost Government $108. Yours for $20. Satisfaction guaranteed. Great Northern Mart, North Adams, Mass.

VETERANS: Flight training under the G.I. Bill. Private, Commercial and Flight Instructor Ratings. Write for information. Gottschalk School of Aeronautics, Adrian, Michigan.

PLASTIC Bird Kite, 6 ft. Red or Blue. Fly any weather. $2.00. Multiple Socket Fixture Co., 374 East 152, Cleveland 10, Ohio.

PROPELLERS—2 & 3 Blade, for ice-snow sleds, boats. Literature. Standard Aerocraft, Box 387, Ft. Worth, Texas.

PROPELLERS for Ice-snow sleds, air boats, catalog 10c. Banks Propellers, R.F.D. 12, Ft. Worth, Texas.

FREE Catalog describes world's most complete line of navigation instruments and texts. Includes famous Weems Mark II Plotters, Dalton E6B and Mark VII Computers, Protractors, Star Charts, Plotting Boards, Watches, Celestial Coordinators, Charts, Sextants, Navigation Notebooks, many more. Weems equipment standard with Army-Navy Air Forces, Commercial Airlines. Write Dept. 3, Weems System of Navigation, Annapolis, Md.

49 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTRIC Pencil: Writes, Engraves all Metals. $1.00 postpaid. Beyer Mfg., 229-C Dixson Blvd., Uniontown, Penna.

CHRISTMAS tree light sets and bulbs. Jeannette Electric, 159 West 23rd St., New York 11, N. Y.

ELECTRIC Pencil—writes, engraves all metals. Battery model $1.00—110 Volt model $3.00 complete. Postpaid. C.O.D.s accepted. Reb Industries, Dept. 265-CP, Elmhurst, Ill.

LAMPS—All parts to build or repair. Catalog 10c. Gyro Lamps, 5416B Clark, Chicago 40.

DIRECT Factory Agents for fast-selling, fine commercial popcorn machines. Nationally advertised. Sales Leads furnished. Excellent profit. Viking Popcorn Machines, Inc., 114 W. 18th, Kansas City, Mo.

WANTED Ex. G.I. Electricians to start motor repair shops. Write Electrical Engineering Consultation Service, 3013 East 6th St., Long Beach 4, California.

SAFETY First—Install illuminated switch plates. 3 for $2 postpaid. A. I. Electric, 5164 Landis, San Diego, Calif.

FREE Catalog of welders, welding supplies, generators, fencers, electric lawn mowers, freezers, and other electrical items. LeJay Company, Minneapolis, Minn.

SELSYN Motors, 3½"x5½", high accuracy, 115 volt, 60 cycles. $11.75 per pair. $2.00 Deposit, Balance C.O.D. Weber, 150 Maple, Hershey, Penna.

140 WELDING, SOLDERING

BUILD Heavy Duty Industrial transformer type Welder. Primary, Secondary separate. Operates 110 or 220 Volts. Alternating Current. Complete detailed plans $1.00. Atomic Arc Welding Co., 1038 So. 19th St., Omaha, Nebraska.

A.C. WELDERS, 110v welds ½" steel $29. Paul Morris, 1850B State St., Schenectady 4, New York.

WELDERS for all requirements. Free Catalog. Write Hobartweld, Box P-1175, Troy, Ohio.

NEW Portable Champion Special; Transformer Welder; 110/120 volt AC; 8 heat stages. Welds, brazes, solders, cuts all metals. Complete with electro holder, mask, rods, carbons, fluxes, cables. Also Special Flame Weld Torch. Full directions, easy to use. Splendid for shop, farm and home repairs. Guaranteed 1 year. Only $27.50. Magic Welder Mfg. Co., 241 NZ Canal St., New York City.

NEW Aircraft Lighting Generators—War Surplus—Only $49.50. Original cost $250.00. Can be used for lighting or converted for use as welder, electric plater, fast battery charger, auxiliary power unit, etc. Model R.2, manufactured by Jack & Heintz, 30 volts, 300 Amp. D.C., shipping weight 68 lbs. Size 16"x7". Also new G.E. and Westinghouse P. 1 Generators, D. C. 200 Amp., 28½ volts, cost $150.00, price $33.00 each. Immediate shipment. Check with order. Greer, 460 South State Street, Chicago, Ill.

PORTABLE Arc Welder. "Build Your Own." Your engine plus Hobart Welding Generator saves $350. Starts paying business. Free Instruction book. Write Hobart Welders, Box P-1174, Troy, Ohio.

WELDERS: New 200 ampere aircraft generators $25.00. Blackhawk Distributors, Olathe, Kans.

WELD, cut, braze with gasoline! Amazing discovery shatters costs. Range jewelry to railroad steel. For farm, factory, shop. New opportunities. New wealth. Important! Investigate. Matthews Mfg. Co., Calgary 22, Canada.

6 AIR CONDITIONING & HEATING

HEATING and airconditioning equipment. Write Moore Equipment Company, Lincoln 6, Nebraska.

80 MACHINERY, TOOLS, SUPPLIES

DRILL GRINDER—Grinds drills to factory accuracy. Calipers with direct reading scales. Circle cutters. New Tool grinder. Lowest prices. Free literature. Factory, 811-A East 31st, Kansas City 3, Mo.

WE offer 60 tons of new war surplus bolts, nuts, washers, screws, etc. All popular sizes. A good mixture for hobby shops, garages, machine shops & farms. A big 40 lb. box for only $6.85. War Surplus Co., Morris & John Sts., New Brunswick, N. J.

FOUNDRY Castings, Blueprints, Materials for woodworking and metalworking machine tools. Suitable for commercial or home shop production. 23 items. Catalog 10c. Lewis Machine Tool Co., 3217 Union Pacific Avenue, Dept. S, Los Angeles 23, Calif.

WATER Burner. More mileage, smoother performance with Syncro Valve Water Carburetion Unit. Visible flow fully adjustable for utmost efficiency. Cooler motor, more power, removes carbon. Thirty minute installation any car. Includes galvanized tank, metering unit, vacuum control, tubing and high-performance vaporizing pressure plate. Guaranteed. Full price $15.00, send $5.00, balance C.O.D. Specify car model. Lewis Machine Tool Co., Dept. S, 3217 Union Pacific Ave., Los Angeles 23, Calif.

NEW Band saw for Home work-shop or Factory use, ideal for hobbyists. Special $14.95 Circular Free. Woodcraft Tools, 147 E. Lake, Minneapolis, Minn.

CONCRETE Building block machines and molds. Catalog free. Concrete Mold Co., 5466 Gravois, St. Louis, Mo.

SHEBEL Saw Filer, $7.50. Files all saws. Free trial. Circular. 730A So. 2nd St., Milwaukee 4, Wis.

V BLOCKS at low prices. 10 sizes for all purposes. Free Literature. Miles Products, 2532 Wabash, Chicago 16.

MACHINE Tools for metal and wood. We specialize in small equipment. Tell us your needs and we will quote you. Kandler, Kalamazoo 12, Michigan, Dept. P.S.

12" BAND saw, tilting table, Oilite bearings, $35.00. 6" jointer, ball bearing, 43" long, $59.50. Spindle shaper, ball bearing, 15x20 table, interchangeable spindles, $49.50. 8" bench saw, large tilting table, ball bearing, complete, $29.50. Immediate delivery. Dealers wanted. Write for catalog. Backus Machine Co., Boyd, Wisc.

ARC welders, AC or DC, 150-600 Ampere. Portable, stationary. Prompt Delivery. Reasonable terms. Also Electrodes and Accessories. Free Catalogs. Write Hobart Welders, Box P-1176, Troy, Ohio.

A COMPLETE Stock of Electric Motors In Single and Three Phase for Immediate Shipment. Standard—Open—Totally Enclosed and Explosion Proof. Also Square D Starters and Compensators. Worthington Air Compressors and Pumps. Porter Electric Company, 330 South Sixth St., Minneapolis 15, Minnesota. Lincoln 7531. Electrical Equipment Coast to Coast.

"WAR Surplus" Bargains! All New! Flexible Drive Cables! Three sizes, 10"—25"—72". Over $5.00 value. Combination offer of all 3 sizes, $1.75—Precision built Right Angle Drives. Complete with flexible drive cables. Only $3.50—Magnet Wire ½ lb. coils No. 22, 10 rolls for $3—Dual Drive Assembly. Geared 7 to 1 reduction, driven by powerful 1/5 H.P. AC or DC Motor. Operates on 6—27—or 110 volts with transformer. Standard attachments convert this unit into a dual—hand or table drill—polisher—buffer—router—sander—etc. May be used as individual drill—sander, etc., by detaching flexible drive shaft. Comes set-up as drill equipped with 3 flexible drive cables and mounting bracket. Original cost to Gov't. over $300.00. Now $15.00. Splendid values! Order today! No COD. "Amazing Bachman's", 23 Herman Street, Rochester 5, N. Y.

RIP, crosscut, combination saws, 8" state arbor, $4.00. L. T. Rix, Ballston Lake, N. Y.

MACHINE shop tools released for private industry; small bench lathe $90. Logan loose change $250. Quick Change $350. 14" screw cutting engine lathe $150. 16"—$180—15" Quick Change $440.—16"-17"—$510. 17" & 32" x 10' Gap lathe $650. 22" x 17' $550. Hand miller $100.—20"-30" upright drills. $100-$300. Amco Bench Shaper $350. Gasoline driven 200 Amp. welder $315. Electric motors 30"-36" Band saws $140-$275. Money back guarantee. Conversion Parts Co., 277 Adams St., Boston 22, Mass.

DRILL GRINDER for twist drills $2.95. See ad on page 282.

NEW Double Voltage Generators, 115 Volt x 1200 Watt. & 28.5 volts x 200 Amps. Excellent for welding Generators, Lighting Plants & Experimental Work. Shipping Wt. 60 lbs. Only $19.75 F.O.B. Surplus Sales, 24th St. & Cudaback Ave., Niagara Falls, N. Y.

V-BLOCKS, adjustable, 4"x4"x15"; 1½"x1½"x4"; both $2.95; Threefold, $6.75. Tenfold $16.75. Am-Standard, 1208 North 13th, Philadelphia 22.

TOOLS, supplies for machine shops, home craftsmen, hobbyists. Low prices. Catalogue 10c. Refund on order. Precision Tool Service, 55 E. Washington, Chicago 2, Ill.

LONG'S Index Head for the Lathe, Milling Machine, Drill Press, etc. Write for folders. Satisfaction guaranteed. Box 537, Torrington, Wyoming.

79 MACHINERY FOR SALE

FOR Sale guaranteed brick cleaning machine $150 F.O.B. Corsicana, Texas. Box 712, Corsicana, Texas.

19 BOATS, OUTBOARD MOTORS, ETC.

FULL size, cut to shape boat patterns, blueprints, 7½—38 feet. Illustrated "Build a Boat" catalog, 10c (coin). "How to Build Boats" book, $1.00. Cleveland Boat Blueprint Co., Dept. A-77, Cleveland, Ohio.

MARINE Power—Easily convert any Ford and Jeep motor (domestic and foreign) with Osco parts and kits. Complete catalogue 25c (coin). Osco Motors Corp., 2020C E. Orleans St., Phila. 34, Pa.

"PLYWOOD Rowboat and Motor Boat K.D. Kits. Assemble and save up to $57.50. Three popular models. Resin bonded, waterproof plywood construction. Easy to assemble in spare time. Write for free literature and complete specifications. C. R. Dillabaugh Boat Co., 7928 N. E. Mallory, Portland 11, Oregon."

MOLDED and sheet plywood boat kits, ready to assemble. 8 to 14 ft. $40.00 up. Genuine Weldwood marine type plywood in various thicknesses and lengths. Send 25c for literature. Marine Mart, Buffalo 7, N. Y.

Copyrighted material

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

"$35 SEA Shell pre-fabricated 8' plywood rowboat. Free illustrated catalog. Hagerty, Cohasset, Massachusetts."

P-38 BELLY Tanks. New steel 10 ft. 2 in. 165 gallon $9.95. Mr. Buckman, 89-V, Merced, Calif.

"MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Company, Department A, Newark 2, New Jersey."

MARINE Catalogue—15,000 deliverable items pictured that should be pictured at price. Send $1.00. Marine Mart, Buffalo 7, N. Y.

CATALOGUE—over 30 world's best plywood designs sent with Wm. Deed's book—"Plywood Boats." Send $1.00. Marine Mart, Buffalo 7, N. Y.

AIR Plane Jettison Tanks streamlined, 10½ foot tear drop shaped, 165 gallon of Light weight lead, coated steel weighs 75 pounds floats over 1200 pounds. Ideal for making trim, inexpensive boats, canoes, Kayaks, Dinghys, Duck Boats, Powered Catamarans and Runabouts, prices $12.50 complete, $9.75 each for three or more US Freight prepaid. General Sales, 205 Market, Grand Rapids 3, Mich.

DUCK & Row Boats, Kayaks. Weldwood Ready cut kits. Booklet. E. J. Croot Co., 103-E, Basking Ridge, N. J.

FREE Catalog describes famous Weems line of navigation instruments and texts. Write Dept. 3, Weems System of Navigation, Annapolis, Md.

51 ENGINES, MOTORS, ETC.

WELDERS for all requirements. Free Catalog. Write Hobartweld, Box P-1178, Troy, Ohio.

WINDING Data, listing 225 motors, single and three phase, $1.00. Motor Data, Box 7631, Kansas City 3, Mo.

WELDING Generator, 150 ampere, $47.50. Other bargains. Butler, 1885 Milwaukee, Chicago.

"BUILD Your Own" Portable Arc Welder. Your engine plus Hobart Welding Generator saves $350. Starts Paying business. Free instruction book. Write Hobart Welders, Box P-1177, Troy, Ohio.

MOTORS! ½ HP. DC converted to AC—All New—High Speed 110 volt, 25 or 60 cycle, ball-bearing motors with forward and reverse switches. Actual cost about $100.00. Now $19.50, three for $50.—or—same motor without reverse switch $15. Three for $40. Countless uses for home mechanics. Order today! No COD orders. "Amazing Bachman's", 23 Herman Street, Rochester 5, N. Y.

MOTOR Winding Tester, for A.C. motors. Repair men send for bulletin. Motor Industries, Quincy, Illinois.

MOTOR, Little Giant, 110 volt, A.C., 1750 R.P.M., 3 inches high, 1/250 H.P. Quiet, Powerful, Runs 6 inch fan. Many other uses. Made by prominent manufacturer. Order now, only $2.95 postpaid. Send check or money order. Intervale Industries, Box 82, Mt. Lakes, N. J.

7 AMERICAN POLICE JIU JITSU

DEADLY Judo—Fiercest fighting technique. Trick knockouts. (200 photographs—plus illustrations.) Expert instructions—Three volumes. Complete $2.25. Variety House, Box 46-X, Wall Station, N.Y.C. 5.

20 BODY-BUILDING COURSES

BAR-BELLS, Dumbbells, Exercise equipment, Courses, Free booklet. Good Barbell Co., Reading, Penna.

HANDBALANCING — Acrobatics, easily learned. Write. Power, 923 W. Vine, Kalamazoo, Michigan.

BARBELLS! Dumbbells, Courses; Finest equipment, immediate shipment; 95 pound set $10.80, extra plates 10c pound. Free Catalog! Bur Barbell Co., 319 Orient Way, Lyndhurst, N. J.

124 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY

"AMMUNITION"—"New and Used"—"Shotguns" — "Rifles" — "Revolvers" — "Pistols" — "Fishing Tackle" — List 10c. Rudolph's, Atchison, Kansas.

SKI-TOWS. Portable. Auto-powered. 500 ft. long. Pulls you both ways. Up, level or downhill. Set up in 20 minutes. Only $125. Send card for particulars. Great-Northern Mart, North Adams, Mass.

5000 BARGAINS, firearms, binoculars, war relics, catalog 40c. Smith Museum, Runnemede, N. J.

SHOTGUNS, Rifles, Revolvers. Over 500 Modern Obsolete. Also Cartridges. List .10 coin. Ed Howe, 26 Main Street, Coopers Mills, Maine.

BOWS-Arrows. Write headquarters for Archery equipment. Quality products. Popular prices. Catalog 10c. Large illustrated Hand Book Instructions, making and shooting, 50c. Archery, 617-A So. State, Chicago 5.

SEND 10c for list 100 new and used guns. Frayseths, Wilmar, Minnesota.

FREE! Klein's big, new complete all-sports Catalog. Features 1000 guns, gun-trading information, $800 prize contest entry blank. Write Klein's, 227 West Washington Street, Dept. CTS, Chicago 6. (Send $1.25 for new gun encyclopedia "The Gun Digest".)

A HODGEMAN made Wading Suit, Waterproof from Collar down to and including boots. Suitable for Duck Hunters, Fishermen and deep water work. Can be inflated for floating. Cost U.S. Navy $42.00 each. While they last, complete for only $7.95. Postage Extra. C.O.D. orders only. Mosak Supply Co., Tujunga, Calif.

55 FIELD GLASSES, TELESCOPES, ETC.

TELESCOPES, Binoculars, Microscopes, —big bargain catalog free. Brownscope Company, 24 West 45th Street, New York.

REFLECTING Telescope, complete 3½" diameter, equatorially mounted. View planets, stars, $19.75. Write Skyscope Co., 475-5th Ave., New York.

WANTED Binoculars—B & L, Zeiss, Dienstglass, French, etc., highest cash prices. United, 7941 So. Halstead, Chicago.

SAVE Money, build your own reflecting telescope from complete kit of finished optical parts: 3" diameter, 39" focal length, mirror and diagonal both hard aluminized, plus 3 lenses for high power eyepieces. All $6.00. Ross, B68 West Broadway, New York 7, N. Y.

TELESCOPES, Microscopes, Cameras, Binoculars, Barometers, Books; Buy, sell, repair. Lists 10c. Rasmussen-Reece, Amsterdam, N. Y.

PORRO prisms for 6x30 Binocular. Perfect. 50c each postpaid. Ross, B-68 West Broadway, New York, N. Y.

POWERFUL Astronomical telescope easily made. Perfect lenses and instructions. 100 power $2.50. 100 and 200 power $3.50. 100, 200 and 400 power $5.50. Clear vision and full power guaranteed. Instructions alone 10c. Suffolk Science Service, Manorville, N. Y.

"LENSES—Condenser 5" diameter by 13" focal length—first quality $3.00. Seconds $2.50. Mitchell Optical Company, P.O. Box 3755, Kirkwood 22, Missouri.

GUN Scope, Army Surplus M-41. ⅞"x8⅞", Weight 12 ounces. Eastman, $14.95. Ed Bartholomew, 8242 Travelair, Houston, Texas.

43 DOGS, BIRDS, PETS, RABBITS

GUARANTEED Chin-Chin Giant Chinchilla rabbits. Greatest amount of delicious meat. Largest, finest, most valuable furs. Tremendous demand for breeding stock. We buy youngsters. Contact world's largest breeder. Willow Brook Farm, R16, Sellersville, Pa.

$250 MONTHLY. Raising Angora Rabbits. Particulars free. White's Rabbitry, Newark, Ohio.

FOR Sale—Coon Hounds. Combination Tree Hounds and High Class Fox Hounds. Rabbit Hounds a specialty. Dures Thomas, Route 3, Albertville, Ala.

ST. BERNARD Xmas pups! Descriptions, prices and 12 delightful pictures, free upon request. Manitou Kennels, Watrous, Sask., Canada.

ST. BERNARD Pups: Champion sired beauties. Franklin Young, R. 3, Riverhead, Long Island, New York.

RAISE Guinea Pigs. Make money at home. Big demand. Booklet free. Taylor, Box 426B, Hapeville, Georgia.

YOU Can make real money raising Golden Hamsters, the new amazing tiny animal. Food costs less than 10c month per animal. Breeds in 16 days! Easily raised in basement, attic, garage, barn or shed. Write for convincing details. Hudson Hamstery, Box 78-S, Palisades Park, N. J.

WHY Walk Your Dog? Install spring steel Dog-Exerciser in your home. Dogs want action. Marvelous conditioner for growing dogs. $3.00 postpaid. A. Hoffman, 2834 No. 57th St., Milwaukee 10, Wisc.

RAISE Diamond Seal Rabbits. We pay $30 to $60 each. Continuous market prices guaranteed. Booklet on raising rabbits 25c, with hutch plans $1. Hansen's Rabbit Institute, 1347 Miller Avenue, Salt Lake City 6, Utah.

SEE "Golden Hamsters" ad on page 48. Shows hamster picture.

GOLDEN Hamsters—New, Novel, Excellent pets for Christmas. $5 pair including two metal cages. Information Free. Hathaway, 609 Deerfield, Silver Spring, Md.

AIREDALES. Pedigreed. Puppies. Grown Females. Mifflin, Lakes Kennels, Ashland, O.

62 FUR FARMING

CHINCHILLAS producer of precious fur—clean, odorless, quiet—raise anywhere breeding stock at reasonable prices—illustrated literature 10c. Tom Towne, 1538 Idlewood, Glendale 2, Calif.

83 MILK GOATS

"MONEY from dairy goats!" Booklet free. Introductory 3-month subscription to leading magazine 25c. Dairy Goat Journal, Dept. 768, Columbia, Missouri.

52 FARMS, OTHER REAL ESTATE

OZARK Lands for All purposes. Actual river frontages. 5 acres $90.00 and upwards. Free list and literature. Hubbard, 424H, Minnesota Ave., Kansas City 4, Kans.

GOOD Farms—Ranches, Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable crops, favorable climate. Write for literature, lists describing typical postwar farm opportunities. Specify which state. J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minn.

CALIFORNIA, Oregon, Washington Tax Lands. $1 to $3 acre minimum offer. 10c (coin) brings descriptive literature, maps. Pacific Lands, Box 2350-PS, Hollywood 28, California.

FARMS, Ranches. All kinds, sizes. Choice of location, climate, production. Information on irrigation projects Columbia and Missouri River Basins. Resorts, summer homes. Milwaukee Railroad territory: Washington, Idaho, Montana, Dakotas, Wisconsin, Upper Michigan, Central Corn Belt. Free folders, price lists. R. W. Reynolds, 613 Union Station, Chicago 6, Illinois.

STROUT'S Big Farm Catalog—Mailed Free. Describes over 2800 outstanding Bargains, Coast to Coast. Time-Money Saver. Write Today. Strout Realty, 255-ZB 4th Avenue, New York 10, N. Y., 20 W. 9th St., Kansas City 6, Mo., 453 S. Spring, Los Angeles 13, Calif.

10 ACRES good land $250.00, $10 down, $10 monthly. R. W. Stewart, Inverness, Fla.

CANADA—for full details regarding any phase of agriculture, such as general farming, ranching and fruit lands, write H. R. Williams, Department of Immigration & Colonization, Canadian Pacific Railway, Vancouver, B. C.

108 POULTRY AND SUPPLIES

MAKE More Money with poultry. Magazine with Experimental Farm explains how. 24 months for only $1.00. Order today! Poultry Tribune, Dept. T, Mount Morris, Ill.

RAISE Fryers new easy way. $6000 yearly possible in your backyard. Booklet Free. Poultry Guild, 1046-B So. Olive, Los Angeles 15, Calif.

RAISE turkeys the new way, write for free information explaining how to make up to $3000.00 in your own backyard, address National Turkey Institute, Dept. 57, Columbus, Kansas.

111 PROFITABLE OCCUPATIONS

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write, Wagoner, P-125 West 86th, N. Y.

LOCKSMITHING — Profitable Business or Hobby! New course teaches you how to pick locks, fit keys, de-code, masterkey, etc. Easy self-instruction lessons. Bargain price. Fascinating 100-page illustrated catalog Free! Write Nelson Company, Dept. 2-01, Chicago 5.

ANNOUNCING home study course in commercial baking. Practical basic training. Good field for those with aptitude. Nearly depression proof. Send for Free booklet, "Opportunities in the Baking Industry." National Baking School, 1315 Michigan Ave., Dept. 1726, Chicago 5, Ill.

BUTTERFLIES! World assortment 20 for $2.00 make pictures, trays, brooches. Free price list. American Butterfly Co., 3457 Park Heights Ave., Baltimore 15, Md.

$40.00 WEEKLY. Made growing mushrooms. Fresh. Dried. Dominion Patent 331,583, free spawn. North American, 169Y Yonge, Toronto, Canada.

MAKE beautiful costume jewelry at home for large profits, hobby or therapy. Free illustrated wholesale catalogue of sea shell, metal and plastic parts contains detailed instructions. Florida Supply House, Bradenton, Florida.

GO South! Young Man. List of fifty concerns with foreign projects $1.00. Foreign Service Institute, Box 3934 A, Miami 24, Fla.

CASH in on Television, now! Amazing opportunity to start profitable business. Technical knowledge unnecessary. Write for free details. Marlowe Television, 10 Radio City, N.Y.C.

Copyrighted material

$150 PROFIT in 4 days made by Floyd Brown, Iowa. You, too, make Big Money in your own profitable business with amazing Liquid Imitation Marble. Fibre-Tite Flooring and Flexible Molds. Full or spare time. Experience unnecessary. Work from your own home. Write for Free Catalog, full information today! Composition Products Co., Dept. 113, 5853 Delmar, St. Louis, Mo.

TECHNIGLO! Make money painting with amazing liquid plastic. White in daylight, shines sky-blue, makes everything visible, in dark. 4 Oz. Kit $2.75. Instructions. Prepaid. United Technical Laboratories, Morristown 4, N. J.

SHELLCRAFT—Beginners kit $1.00. Catalog free. Burton, Box 27, Station A, St. Petersburg, Florida.

UNPAINTED Plaster Ornaments made from new, wonderful Loxite. Beautiful designs easily decorated with water colors or oil paints. For Profit or hobby. Illustrated List Free. Midwest Novelty Mfg. Co., 108-B Cedar St., Anaconda, Montana.

MAKE beautiful mirrors from ordinary window glass. No expensive equipment required. Details free. Tes-co, Box 189-SE, Wilkes Barre, Penna.

STUDY and become licensed practioner of new psychological religious conception called "Oneness" for Health, Happiness and Prosperity for self and others. Home Study Course. 3,000 word booklet free. Write "Oneness Society", Box 171, Stoneham 80, Mass.

DIRECT Factory Agents for fast-selling, fine commercial popcorn machines. Nationally advertised. Sales Leads furnished. Excellent profit. Viking Popcorn Machines, Inc., 114 W. 18th, Kansas City, Mo.

MUSHROOMS Grown. Boxes, Barrels; Illustrated Instructions, 50c. Spawn $1.00. Gordons, 553 William, Winnipeg, Manitoba.

$5000, from half acre growing Ginseng, seed supplied. Crop bought. Particulars 10c. Associated Growers, 1109 Corydon Ave., Winnipeg, Canada.

22 BOOKS, PERIODICALS, ETC.

WHAT Every Mason wants. We have Masonic books for Blue Lodge, Chapter, Commandery Scottish Rite and Shrine. Our rituals are used the world over. Send for our free catalog of books and rituals for Masons, Odd Fellows, Knights of Columbus, etc. Ezra A. Cook, Publisher, Inc., P.O. Box 796-RMY, Chicago 90, Ill.

MAGAZINES (back dated)—foreign, domestic, arts, Books, booklets, subscriptions, pin-ups, etc. Catalog 10c. (refunded). Cicerone's, 863 First Ave., New York 17, New York.

GOOD "Used" Self-instruction educational books on all subjects bought, sold, rented, exchanged. Satisfaction guaranteed. Complete information and 100-page illustrated bargain catalog Free! Write—Nelson Company, Chicago 5.

BIG Profits Taking Subscriptions For All magazines. Agents' Confidential Catalog listing over 2500 periodicals and complete starting supplies Free. Pines Subscription Agency, Flushing, N. Y.

EDUCATIONAL Books sold cheaply or rented for small fee. Books bought. Money-back guarantee. 4,000 Bargains. Catalog Free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

TRADE and Class Magazines—Current copies. All fields. Free price-list. Commercial Engraving Publishing Co., 34S North Ritter, Indianapolis 19, Indiana.

ADULT Books 25c. Five—$1.00! Free Bookalogues! Hirsch, Spring Valley 3, N. Y.

EARN Extra Money handling Magazine Subscriptions, Books, Greeting Cards. Excellent Commissions. Cassel Publishers, Westfield, New Jersey.

"FIX It Yourself"—home repair book. How to fix appliances, furniture, plumbing, etc. 256 pages, 163 pictures. $1.49. Popular Science, Dept. 117-C, 353 4th Avenue, New York 10, N. Y.

"RADIO For The Millions"—practical book. Complete instructions for building 78 radios, phonographs, other sets. 192 pages, 648 pictures. Regular Edition $1.49. Popular Science, Dept. 117-C, 353 4th Avenue, New York 10, N. Y.

BACK-Date Magazines, Books. Specific issues—years. Arkell's, Tarzana, Calif.

ALL pocket books. New, used. Catalog free. Gordon's, 2613b Crenshaw, Los Angeles 16.

ADULT books. Artist's Pin-ups. Catalog, Sample 10c. Baker Service, Box 1840, Cleveland 6, Ohio.

BACK issues magazines, reasonable. Reedmor, 240 East 9th, N. Y., N. Y.

FREE bargain catalogue for adult book buyers. Kissin, Box 134, Madison Sq. Sta., New York City.

MIDGET Bible, Postage Stamp Size, 25c. Senn's, 1307 9th, Watertown, Wisc.

PROFITABLE Hobbies Magazine, the best. Only $3 a year. Victory Service, 11PSM, Emmaus, Penna.

ILLUSTRATED Catalog. Wholesale Directory. 10c. Latshaw Sales, Sunnyside-C1, Indianapolis 44, Indiana.

BOOKS Found free! All Subjects. Send Wants! Jaher Book Service, 620-K East 178 Street, New York 57.

MEN Only. Fresh stuff in little Books. 10 for $1.00. DuLaw Novelties, Box #297, East Chicago, Indiana.

COLLECTORS Photographs — Curios — Books—Lists dime. Jack's Shop, 591 12th Street, Oakland 7, Calif.

USE "Washington at Prayer" anti-Communist Blotters in your business. Write for samples. Frank Martin, Marshall Bldg., Cleveland, Ohio.

THE Key To A Million. "The Stock Market: How it functions and why." A hand-book for the guide of the American laymen. $1.00 C.O.D. B. G. Research Associates, P. O. Box #111, Murray Hill Station, New York 16, N. Y.

"LOVE Ruthbella!" Intimate Diary Confessions;—privately published $5 book now reprinted, price only $2.00! Make this excitingly beautiful, picturesquely revealing tome your secret delight! Confidential listing: "Lonely Hour Books" included. Send two dollars today for the book thrill of your life! Poets Corner Press, 436 Center Street, Fort Lee, N. J.

BOOKS: Psychiatry, Hypnosis, Marriage. Free Catalogue. Abbott-Dunhill, 752-D Northwest 66th, Miami 38, Florida.

81 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS', Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine. Catalog 10c. Book Co., Box 671, St. Louis 1, Mo.

"MAGIC Vanishing Card". Throw it into air, it completely disappears, reproduce it later from spectators pocket. Easy to do. Complete 25c with magic catalog. The Magician, 2463-D, Kensington Ave., Philadelphia, 25, Pa.

WORLD'S largest professional magic shop, keeps you in touch with latest tricks. To receive mailings, send 35c for new catalog. Holden's, 220-P West 42nd St., N. Y.

200 ELECTRIC Stunts, 110 volts, $1. Cutting Sons, Campbell 3, Calif.

500 TRICKS. Send only 10c for Douglas' famous 112-page Catalog 500 Tricks. New magic for amateur, professional. America's fastest service for 25 years. Douglas Magicland, Dept. 2, Dallas, Texas.

BIG Magic Magazine, trick and price list—25c. Lloyd S. Jones, 4064—39th Avenue, Oakland 2, Calif.

GUARANTEED magic tricks! Amateur, Professional. Big 8½ x 11 illustrated catalogue. 10c. Newton's, 202-B, Bonham, Tex.

THE True Secret of Ventriloquism. Free booklet. Quackenbuch, Big Flats, N. Y.

HYPNOTISM! 25 Lesson Course. $1.00. Monarch, 38-S Jefferson, Auburn, New York.

BE a Magician. Large professional magic catalog of latest tricks. 25c. Ireland, F-109 North Dearborn, Chicago.

15 CARD tricks 25c. Free illusion. Morron, 2316 5th Ave., Altoona, Penna.

"MYSTIFY your friends. New Illustrated, Narrated, Card Tricks, copyrighted. $1.00. Box 691B, Atlantic City, N. J."

WOW 'Em with DeLand's spectacular "Card Locator"! Locate any card in ordinary deck—deal straight royal flush! 25c catalog of magic, hypnotism, rare courses and books, included. Ar-Ges Company, 790 Broad St., M11, Newark 2, N. J.

MAGICIANS' Headquarters. 400-page Professional Catalogue, latest pocket, parlor, stage tricks. World's finest magic. Send $1.00 for Catalogue (refunded first $5.00 order). Kanter's, S-1311 Walnut, Philadelphia 7, Penna.

1948 EDITION "Magic for Fun or Profit." 10c. Magic Cellar, 230 Bankers' Investment Bldg., San Francisco 2, Calif.

"MAGIC As A Hobby," book of 108 simple, mystifying tricks, 50c. Ernest Byrn, Box 4005-B, Knoxville, Tennessee.

"VENTRILOQUISM. Easy Method. Stamp brings particulars. Smith, 801 Bigelow, Peoria 5, Ill."

MAGIC You Can Do! Ten baffling tricks complete with all props Plus big booklet jammed with legerdemain. Only $1.00. Modern Merchandise, Dept. PS-13, 412 S. Market, Chicago, Ill.

PERFORM over 100 baffling sleight-of-hand tricks with ordinary thimble. Easy! 42 action photos, complete instructions $1.00. Garnet Specialties, Box 502-B, Valparaiso, Ind.

TRICKS, Secrets, Cards, punchboards, etc., explained. Big illustrated circular free. Mack, Box 1278-P, San Francisco.

"STARTLING performances". Flip any coin heads or tails at will! Any Coin! Anytime! Copyrighted manual 25c mailed. Arro Company, Box 961-C, Bridgeport 1, Conn.

500 PAGE catalog, 6,000 novelties, gadgets, timesavers, hobbies, fun-makers, etc. 10c. Johnson Smith, A-74, Detroit 7.

VANISHING Quarter trick and catalog 25c. Sterling Magic Co., Royal Oak, Mich.

63 GAMES, ENTERTAINMENT

HOME Model Slot Machines and Coin Operated Games. Write for catalog. Webb Distributing Co., Dept. P4, 6 South Kedzie Ave., Chicago 12, Ill.

36 COIN COLLECTING

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

COMMEMORATIVE $½ — Columbus, Washington, Cleveland, Stone Mountain, $1.50 en. Illustrated Catalogue 25c. Norman Schultz, Salt Lake 9, Utah.

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 47 years.

OLD Money Wanted. Do you know that Coin Collectors pay up to $100.00 for certain U. S. Cents? And high premiums for all rare coins? We buy all kinds. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

WORLD Coins 30 different $1.00. Harry Elsholz, Box 9014, Pittsburgh 24, Penna.

$2.00 TO $200 each paid for hundreds of Old or Odd Coins. Indian-Lincoln-Foreign Wanted. Keep all until posted. Send 20 Cents for illustrated Coin Value Book. 4 x 6. Guaranteed Prices. 40 years in business. Coin Exchange (1), Le Roy, N. Y

LARGE cents—Indian Heads. Reasonable. Free lists. Hutchinson, 3463 "I" Street, Philadelphia 34, Pa.

FREE Foreign Coin, Bill and Catalog to Approval applicants. Nassau Hobby Center, Freeport, New York.

32 DIFFERENT coins $1.00. Bishoff, 714 E. 8th, Kansas City, Mo.

40 MIXED Indian Pennies $1.00. 50 different foreign coins $2.00. Internat'l, 656 West 171, N. Y. 32.

WE purchase Indianhead pennies. Complete all coin catalogue 10c. Zack Fairview, 277 Broadway, N. Y.

RINGLING Brothers Circus Scrip Set (6) $1.00; 12 Wooden Nickels $1.00; 20 different Indian Cents $1.00; Whitman Coin Albums 25c; Handbook 50c. Large Retail Catalogue 15c. Bebee Coin Company, 1180 East 63rd, Chicago 37, Ill.

FOREIGN Coin Approvals on request. Delmonte, 725 West 172, N. Y. 32.

96 OLD STAMPS WANTED

I WILL pay $100.00 each for 1924 1c green Franklin stamps, rotary perforated eleven (up to $1,000.00 each unused). Send 6c for large illustrated folder showing Amazing prices paid for old stamps, coins, and collections. Vernon Baker, PS-711 Elyria, Ohio.

WHAT have you to offer? Collection? "Shoebox" accumulations? Anything in Stamps? We urgently need them. Spot cash paid. Cosmopolitan Stamp Co., 1457 B'way, N. Y. C.

127 STAMP COLLECTING

WORLD'S Largest Diamond And Triangle Stamps, Free Stamp Magazine. Stamps from Fighting Free French, 20 stamps from 20 different Countries. Pictorials, Airmails. Big Bargain 5c with approvals. Capital Stamps, Dept. 10, Little Rock, Ark.

DEALER'S Wholesale Catalog. Postage 3c. Franksco, 5031 Queensbury, Baltimore, Maryland.

50 DIFFERENT including scarce diamond-shaped airmail 3c to approval service applicants. Avalon Stamp Co., Dept. S, Springfield 8, Mass.

FINE Approvals, freshly mounted. Fast, personal service. Tell me what countries you prefer and I'll send their stamps. Milton Skinner, 438 Locust, Long Beach 2, Calif.

200 DIFFERENT stamps, 6c, to approval service applicants. Tatham Stamp Company, Springfield 50, Mass.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps, 1435 E. 67th Place, Chicago 37.

Copyrighted material

ZOWIE-E-E! A Barrel of Fun for only a Dime! 500 United States Stamps—Absolutely unpicked and unsorted, just as received from church missions. Many varieties, including large commemoratives, airmails, high denominations up to $5.00! Stampdom's biggest package of fun, and you might find something really valuable!! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Co., Dept. 55, Camden, New York.

FREE—The Stamp Finder. Big new edition—32 pages profusely illustrated! Tells at a glance the country to which any stamp belongs and so where to place it in your album! Also: 25 different stamps from Vatican City, Palestine, Cyprus, San Marino, etc. All sent to Approval Applicants enclosing 3c postage. Garcelon Stamp Co., Box 918, Calais, Maine.

PIRATES! Head Hunting Natives! Kings! Statesmen! Man-eating Bull of Greece, Nazi Hitler Head, Roosevelt, Churchill and Stalin on stamps in our "Mammoth Collection" containing over hundred interesting stamps. Only 10c to approval applicants. National Stamp Sales, 276-A West 43rd Street, N.Y.C. 18.

WOW! $10.00 Worth Of Fun Only 10c. What a treasure hunt! Big package 500 Foreign Stamps—just as received from foreign missions other sources. Includes stamps from Africa, South America, Free French, Cape Juby, Palestine, etc., includes airmails, commemoratives, and stamps worth up to 50c. This offer sent for 10c to serious approval applicants only—one to a customer. Jamestown Stamp Co., Dept. 5, Jamestown, New York.

VICTORY Packet Free—Includes stamps from Tanganyika—British Cayman Islands—Animal—Scarce Babyhead—Coronation—Early Victorian—Airmail—Map Stamps—Including big illustrated catalogue. Send 5c for postage. Gray Stamp Company, Dept. P. R. Toronto, Canada.

SCARCE United States stamps nearly 100 years old; Roosevelt set complete; $5.00, $10.00 stamps; Army, Navy, Marines, Coast Guard, Columbian Exposition Commemoratives; 19th Century Revenues. Everything 5c to Buyers U.S. approvals. Metropolitan, 140-A Nassau, N. Y. C. 7.

FREE! Crystal-Mount Sample. Harrisco, 204 Transit Bldg., Boston, Mass.

START your own stamp business. Write for free circular. Donald Shepard, Security Building, Chicago 2.

25 BEAUTIFUL stamps from 25 French Colonies and our price lists. One silver dime. Stampsales, Box 1649F, Oakland 4, California.

HISTORICAL Collection!CavalryCharge! (Bulgaria)—Flaming Sword! (Ireland)—Big She-Wolf! (Italy)—Fort! (Dominican Republic)—Field Marshal! (New Zealand)—Pitcairn Mutiny Island!—Commemoratives! Pictorials! Only 3c. Approvals. Star Stamp Company, Dept. 1, Lakewood, N. Y.

BEST $1.00 Buy: 28 different stamps honoring President Roosevelt including 7 complete issues, Airmails, Short sets, worth almost $3.00 plus—without extra charge—206 different British Colonies including Peace issues, plus 100 different Greece. A total retail value of $5.85 for $1.00 only to adults applying for foreign approvals. Collectors' Stamp Service, 130-P West 42 St., New York 18, N. Y.

UNITED STATES approvals complete coverage fine quality, attractive prices. Seminole Stamps, Box 1138-S, Coral Gables, Florida.

STAMPS 100 Years Old. Every collector should have at least a few stamps nearly 100 years old. Although hard to get, we offer a wonderful selection of ten old 19th century foreign stamps and also the blue re-issue of the 100 year old first U. S. stamp, the famous 5c Franklin. All for only 10c. Kindly state whether approvals shall consist of U. S. or Foreign Stamps or both. Globus Stamp Company, 268 Fourth Avenue, New York 10, N. Y.

STRANGE Lands Airmails. Liberia, Mozambique, Venezia Giulia, Morocco, Bolivia. Everything 5c with Approvals. Raymax, 123-X William St., NYC 7.

PROUDLY presenting 3 exceptionally fine old U. S. covers, First Days, Cachets, Commemoratives, etc., Sea Horse, 1311 Lincoln Place, Brooklyn, New York 13.

120 DIFFERENT stamps 3c with approval request. Appleman, Ida, Mich.

U. S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock, 61 O'Brien Pl., Brooklyn, N. Y.

31 DIFFERENT with George Washington Stamps, from Brazil and Ecuador; Pirate Island; Victory issue; Medical set; others—all 4c with approvals. Grayson Stamps, Sherman, Texas.

EGYPT—15 Different, 5c to approval applicants. Bohemia Stamp Service—2, Bohemia, N. Y.

FREE U. S. Price list postage 3c. M. Hanna, 335 5th Ave., Pittsburgh 22, Pa.

OLD scarce U.S. Seconds on approval. Slightly defective, nice appearance, bargain prices. Hearnfeld, 551 Clinton, Newark 8, N. J.

UNITED STATES Price list. Send Postage. State Stamp Corp., 1225 Park Bldg., Pittsburgh 22, Penna.

WORLDWIDE Different: 200-25c; 500-60c; 1000-$1.50. Beacon Sales, Maynard 3, Mass.

DIFFERENT United States 10c Price list free. Seidenberg, Cassopolis, Mich.

"ROOSEVELT, Churchill, Stalin, Hitler, Vatican City stamps free, to approval applicants. Flamingo Stamps, Box 517, Miami Beach, Florida."

COMPLETE outfit; only 5c, consisting of hinges, perforation gauge, book for 100 stamps, 75 different stamps and approvals. Ernest Moumblow, 740 Hegney, Bronx 56.

10 DIFFERENT Mint Mexico, 10c to approval applicants. Rio Stampco, Box 1708, Brownsville, Texas.

FREE 35 stamps with approvals. All your duplicates exchanged Free. Hohowski, 305 Phila., Canonsburg, Penna.

3 DIFFERENT mint blox 10c, approvals. Robert Whealey, 13 Pershing Blvd., Baldwin, N. Y.

BRITISH Empire! 55 Different including Batum, Burma, Cyprus, Gwalior, Tasmania, 5c to Approval Buyers. Lyman, 97 Nassau St., New York 7.

FREE — Canadian Sets Royal Visit, George VI, George V, Coronation, Jubilee, others, to approval applicants. Ensign, Box 118-P, So. Orange, N. J.

UNITED States and Foreign stamps sent on approval; outstanding quality, low prices. Fred Herzberg, PS 168 Oak St., Elmhurst, Ill.

UNITED STATES Stamps on ten days approval! Lowest prices! Finest quality! Fast, personal service! Thrifty Service, 727 Silver, Silver Spring, Maryland.

WHOOPIE! Wowie! 25c worth of U. S. stamps free! No obligations! Write: M & N Co., 742 Sheffield Ave., Brooklyn 7, N. Y.

SELLING large collection, 50% Catalogue. Minimum sale $5.00. Kinnear, Box #4, Seabold, Wash.

FREE!!! Mint British Colonies from Solomon Islands, Caymans, Grenada, Dominica, Turks Caicos. Absolutely free to new approval applicants. Viking, 130-P Clinton St., Brooklyn, N. Y.

U S Pricelist on Request. Francis, 3926S South Jefferson, Norwood, Ohio.

BET You Haven't These! South Georgia, South Orkneys, Grahamland, South Shetlands—Shortlived Falkland Dependencies—Everything 3c with approvals. Viking, 130-P Clinton St., Brooklyn, N. Y.

BRITISH, Spanish, French Colonies, Vatican, Hitler heads, and airmail packet, free with approvals. Pan-American Stampco, Box 145, New York 33, N. Y.

25c SENT with your request entitles you to $1 worth of stamps, your choice, from our gigantic first approval selection. Cosmopolitan Stamp Co., 1457 B'way, N. Y.

FREE! Negro Triangle; Turks Islands "Cactus"; Dakar; Guinea; Palestine; "Fairy Tale", Pirate Chart, Map, Ship, Sea Lion and Snake stamps; French, British, Portuguese Colonies, etc., Free for 3c postage. Approvals. Potomac Stampco, Washington 10, D. C.

FLAG Stamp Free With U.S. Approvals. E. Wenigman, 929 Oakdale, Chicago.

FREE! Porto Rico Airmail Triangle (World's Only American Colonial Triangle!) Cook Islands, Syria, Ivory Coast, Damascus, Elephant Land, Cambodia, Harem, Philippine "Slave", others. All Free for 3c postage. Approvals. Belmont Stampco, Washington 10, D. C.

10 DIFFERENT U. S. Over 40 Years Old, 5c. Foreign, U. S. approvals. Scott, 22 Middle St., Lexington 73, Mass.

25 DIFFERENT Stamps 10c. Tunis And Carpenter, Wakeman Ave., Newark 4, N. J.

YOUR Money's Worth! Seychelles, Djibouti, Angola, Chinese Hunger Stamps and over 100 different other stamps. Everything 10c to approval applicants. Atlas Stamps, 4220 West 16th, Dept. M, Little Rock, Ark.

AMERICAN Flags in Natural Colors on Panama, Paraguay, Dominican Republic, others, 6 varieties—10c. Worth 35c! Approvals. Becker, 63 Albemarle, Yonkers 2, New York.

FREE!! Rare Philippines sheet cataloguing $2.50 to collectors sending 5c postage for bargain approvals. Criterion Stamps, North Hackensack 2, N. J.

ONE Thousand All different Stamps from Abyssinia to Zanzibar, catalogue $22.50 for $1.00 to Adults Requesting Approvals. Frasek Co., White Plains, New York.

PENNY Approvals that satisfy. Neil Gronberg, Box 5441S, Philadelphia 43, Pa.

MEXICO: mixed used, unused $1.00. Herrera, Ezquerro 10, La Paz, Baja California, Mexico.

U.S. approvals. Large selections low prices. Panther, Box 76-R, Dorchester 24, Mass.

FREE Packet of colorful stamps from exotic lands including airmails to new approval applicants. Wesken Stamp Company, Box 66P, Queens Village, N. Y.

UNPICKED: 5000 U.S. $2.00, 3000 Foreign $2.00. Satisfaction guaranteed. Kuhn, 3315 80th, Jackson Heights, N. Y.

100 DIFFERENT—Oriental Countries—10c. Box 6618, Northeast, Kansas City, Mo.

FREE! Tiny Chinese "Midget" War set Approvals. Seminole, Elliston 10, Va.

GOLDEN Mixture, Variety Countries, 25c. MacDonald 30-P, Seaman Ave., New York 34.

TRIANGLES — Airmails — Pictorials included in this lot. Also African beauties, midget stamps, etc. Great bargain. Everything 10c. Japhe, 1775 Broadway, N. Y. 19, N. Y.

"200 DIFFERENT stamps—cataloging up to 50c each—only 3c to approval applicants! Littleton Stamps, Littleton 47, N. H."

WHOLESALE Bargain List to Dealers. Borkman, 3414-10 St., Tampa, Florida.

1000 Well mixed U. S. 25c. Monjar, 1750 Fairmount, Cincinnati 14, Ohio.

GENUINE "Goya Nude" set, cataloging $1.05, complete 35c. Approvals. Royal Stamp Co., Tamaqua 2, Penna.

ROGUES Gallery Packet, Hitler-Mussolini, 30 others. 3c. Premium,Hartland 6, Me.

PICTORIAL Packet! Philippines, Patiala, Palestine, Paraguay, Portugal, Porto Rico, Poland, Peru, Persia. Free to Approval Applicants. Eliot Stamps, 86-31 Eliot Avenue, Rego Park, N. Y.

ERITREA, Ethiopia, Huge Roosevelt, Free-approvals. Logan Stamps, Box 4, Newlots Station, Brooklyn, N. Y.

STAMP Magazine! Chock-full, information, news! Next three issues 10c! "Stamp Post", Station A, Pasadena 3, Calif.

BOY! Oh! Boy! Dandy collection, Monaco Roosevelt Triangle, U.S. commemorative stamp over 50 years old, Hitler-Mussolini stamp, many others. Only 5c to new approval applicants. Modern Stamp Service, 644 East 233rd Street, N. Y.

"ATTENTION! Over 120 different including Norfolk, Abyssinia, set Morocco, set Tunis, etc. Everything 10c with approvals. Buras, 414 Coolidge, New Orleans, La."

$27.00 CHINA airmail, 10 different Egypt and fifty others, 10c to approval applicants. Burmaster, Box 1910E, Los Angeles 53, Calif.

50 DIFFERENT Free to Approval Applicants. Buckeye Stamps, Urbana, Ohio.

LIBERIAN Triangulars, set 10c with approvals. Vargo Stamps, 6044 South Fairfield, Chicago 29, Illinois.

STAMPS from 40 countries, including Fiji 10c. No approvals. Elzea, Bowling Green, Ohio.

BIG VALUE—12 sets—12 countries—Triangle, maps, animals. With approvals, only 25c. Wirth, Norwichtown 2, Conn.

FIVE Old U.S. Mint at Face Value. Catalogues 56c #498, 552, 554, 634, 687. 10c to general approval applicants. Middleton Stamp Company, 78-14 Woodside Avenue, Elmhurst, L. I., N. Y.

FREE—Big Packet 55 Different. Approvals. H. Wisehart, Frankfort, Ohio.

POSITIVELY Free! Scott's Latest $6.00 International Stamp Album or 1948 Catalogue to approval customers. Claire's, 7402 Bayparkway, Brooklyn 4, N. Y.

20,000 DIFFERENT 1c-5c each! Gordon Davison, Box 1019A, Manchester, N. H.

(EXCHANGE foreign stamps, bills for classical phonograph records). Greek 25,000,000 drachma inflation bill 10c. 1,000,000,000 pengö Hungarian, 15c. Beal, 402 Grand, Oakland 10, Calif.

MINT British Colonies, Commemorative Sets, Air Mails etc. $25.00 buys a collection of Real Value. Cash with order. Money Back Guarantee. Lennig, 9338 Amesbury, Cleveland 6, Ohio.

FREE! Complete Balkan aviation set with approvals. Beaman, Elliston 10, Va.

"SEND for our better U.S. approvals today. Box 488-A, Minneapolis."

FREE—Famous Americans Set, plus Flag Set, plus the National Parks set, plus the Presidential Set to the $5. A total of 90 stamps absolutely Free to customers for our unsurpassed United States or Foreign selections. Send 3c postage for 15 of the above mentioned stamps and full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 209, New York.

Copyrighted material

POSITIVELY Greatest Free Offer—Latest Scott's International $6.00 stamp album—covering entire world. contains 36,000 illustrated descriptive spaces; Scott's 1948 Standard $7.00 catalogues "Philately's Encyclopedia"—absolutely free to applicants for foreign approvals becoming customers. Plymouth Specialty Company. Dept. A3. Bell. California.

FREE! Ten Mints: Ethiopia Red Cross plus Free French. With Approvals. Florida Stamp Company. Box 807. Miami 5. Fla.

MIXTURES price per pound—Argentina $2.50; Denmark $1.75; France $1.60; Germany $2.00; Holland $1.60; Italy $1.25; World $2.00. Longacre Shop. 100-j West 42nd. New York City 18.

DOLLAR Each: 2000 British; 1200 U. S.; 400 Ireland: Seiden. 1331-S Intervale. N. Y. 59.

WASHINGTON Bicentennial Set 10c. United States-Foreign Approvals. Yokums. Box 1327. San Antonio 6. Texas.

BOOKLET. "Collecting Stamps" How. When. What? 50c to approval applicants. Bjorn Neilsen. Monmouth 1. Maine.

70 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors. Dept. 30-E. 2926-Eye St., N. W., Washington 6. D. C.

500 PAGE catalog. 6,000 novelties. gadgets. timesavers. hobbies. fun-makers. etc. 5c. Johnson Smith. A-75. Detroit 7.

KLONDIKE! For Hobby Jewelry Makers! Novelty Jewelry Findings swept from tables of large manufacturers—parts for Bracelets — Pins — Earrings. etc. — unfinished. Chains — Rings — Pins — Stones — Clips—Beads—many other items—1 Lb. Bags—$2.00 Per Bag in 5 Bag Lots. $3.00 Sample Bag. Prepaid Only. Mdse. Distributing Co., 19 E. 16th St.. New York 3. Dept. P.S.

FREE Price List. 34 pages of Tools and Supplies showing hundreds of items for the leather crafter. A complete selection of leather stock. Yours for the asking. Russo Handicraft Supplies. 239 S. Spring St.. Dept. S. Los Angeles. Calif.

Sea Shells from Seven Seas for Collectors. curios. manufacturers. retail. wholesale. Skipper Nailor. 3616 Curlew. San Diego. Calif.

24 DIFFERENT pictorial comic buttons $1.00. Theron Fox. 1024-A Carolyn Avenue. San Jose 10. Calif.

"SWAPPERS - Kollektors - Hobbyists" Whatcha got? Whatd'ye want? National Bulletin 25c. Royal Oak 128. Mich.

UNUSED Match Book Covers. 100 all different $1.00. Free catalog. Charles Edelman. 1311 P East 84. Cleveland 3. Ohio.

MEN. Boys—worldwide hobbyists' contacting service. Hobby Directory. Box 91. South Orange. New Jersey.

FOREIGN campaign ribbon packet and illustrated book $1.00. Insigniacraft. 236 28th Avenue N.W.. Calgary 1. Canada.

CIRCUS Photographs! List and Sample 10c. Box 1028. Minneapolis. Minnesota.

"GENUINE" deep red Arizona Rubies (Garnets). Send quarter for packet. Mineral Specimens Company. Box 2651. Phoenix. Arizona.

CAMPAIGN Ribbons—Beginner's Package—Introductory Price—50c. contains 15 Assorted Ribbons. L.H.G. Company. 19 E. 16th St.. N. Y. 3.

8 ANTIQUES, RELICS, INDIAN GOODS

ANTIQUE-modern pistols. revolvers. swords. daggers. armor. 174-page illustrated catalog 50c. Robert Abels. 860½ Lexington Avenue. New York 21.

10 ANCIENT Indian Arrowheads $1.00. List free. Lears. Box 569. Galveston. Texas.

85 MINERALS & PRECIOUS STONES

JEWELRY stones removed from rings. etc. 100 assorted $2.40. 50 large ones $2.40. B. Lowe. P.S. 50. Holland Building. St. Louis 1. Mo.

ZIRCONS. mined and mastercraftsman cut in Siam. Flash. Fire. Sparkle of diamonds. Reputed to bring good luck. Sample $2.00. Two $3.50. Wholesale $1.50 carat. Imhusex P.S.. 336 West St.. White Plains. N. Y.

GEMS. precious and semi-precious. all genuine from world wide sources. Deal direct. no overhead. save money. Catalog 10c. Hill Co.. Route 7-K. Salem. Oregon.

GENUINE Zircons sent on approval. Write for selections of zircons to choose from. Make selection and return to us for mounting. Send no money. Special: 3 genuine zircons. unset. approximately total 3-kts. $6.00. Make big money selling genuine zircons. Send order or write for details today. Lowe's. Dept. PS-11. Holland Bldg.. St. Louis. Mo.

ZIRCONS. Mystic. genuine Siamese gems. Brilliance of diamonds. Treasured by ancient Egyptian kings as good luck charms. Stand diamond acid test. Diamond facet cut. unmounted. Wholesale $1.50 carat. Sample $2.00. two for $3.00. Will mount in good rings at popular prices. B. Lowe. Dep't. PS 10. Holland Bldg.. St. Louis. Mo.

26 CAMERAS, PHOTO SUPPLIES

PHOTOGRAPHY for pleasure or profit. Learn at home. Practical basic training. Long established school. Write for booklet. American School of Photography. 1315 Michigan. Dept. 1741. Chicago 5.

CASH! Spot cash for cameras. lenses. binoculars. movie and still equipment. Send full description for prompt cash offer. Over 36 years of dependability. Bass Camera Co.. Dept SP. 179 W. Madison St.. Chicago 2.

DEVELOPING and Printing Kit—Complete $4.95. Kit #1: Three 4x6 Trays. One set of Printing Masks. One Safe-Light. Four Universal M-Q Developer. One Qt. Acid Fixing powder. One pkg. (24 sheets) Print Paper. One Graduate. One 4x6 All-Metal Print Frame. One Thermometer. Two Film Clips. One Instruction Booklet. Kit #2—Same as above but includes a Candid type Camera that takes 16 pictures on each roll of film—Complete $7.95. We can supply all items needed for replacement listed in above Kits. Send money order or check today and include 75c to cover handling and postage. Sorry. no C.O.D. orders. Simon Bros.. 144 Elmora Avenue. Elizabeth. N. J.

BASS Says: Trade Cameras? For 36 years Finest equipment available. Always Satisfaction Guaranteed Or Your Money Back! Bass buy 'em. trades 'em. Bass Camera Co.. Dept. SP. 179 W. Madison St.. Chicago 2.

CAMERA Portrait Lens One. Two or Three plus $1.00. Glare Proofed $3.00. attachment $1.50. Hill's. 1408 Jefferson Ave.. Des Moines. Iowa.

CAMERA'S-Enlarger's — Movie Film — Big Free Catalog. Cavalier Camera. 1822 Center. Pittsburgh 19. Penna.

ARTIST'S Models. List—Sample 10c. 20 Photographs $1. Sparton Sales. Box 2100. Cleveland 8. Ohio.

MAKE Greeting Cards from your own negatives. 35mm and up. New designs with half-tones. Free Booklet. Photo-Mart. Dept. K.. 365 E. 193 St.. New York City 58.

TRI-SCREEN Diffuser for cameras and enlargers. Controlled Diffusion. $1.00. Guaranteed. Photo-Mart. Dept. L.. 365 E. 193 St.. N.Y.C. 58.

CAMERAS Contax Leica Lenses. Free List. Horton Photo. Santa Ana. Calif.

ARTISTS Pin-ups. 20 photos $1. List—Sample 10c. Baker Service. Box 1840. Cleveland 6. Ohio.

OIL coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School. 1315 Michigan. Dept. 1746. Chicago 5. Ill.

102 PHOTO FINISHING

OIL coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School. 1315 Michigan. Dept. 1722. Chicago 5. Ill.

18 CHRISTMAS Cards and envelopes $1.00. 60—$3.00. send negative. Three prints each 8 exposure rolls 40c. Two each 35c. One each 25c. Reprints 3c. Fred A. Eastman. Bode. Iowa.

PERSONALIZED Photocards. This year send Christmas cards made from your favorite snapshot. Relatives and friends will love them. See before you buy; send negative plus 3c postage for sample card and full details. Franklin Photofinishing. Box PS-11. Framingham. Mass.

EVERY Photographic service. Free lists! Phototron. Musgrove Bldg.. Andover 2. Mass.

ROLL developed and 8 prints 30c. Overnight Service. Free Mailers. Tri-Plex Photo Service. Box 375. San Francisco. Calif.

ROLLS Dev. & Printed Giant size 30c. Reprints 3c. Thrifty. Box 688. Sta. H.. Los Angeles. Calif.

CUSTOM Finishing. Lowest Prices with money back guarantee. Black & White & Color. Fuller Photo Co.. 44 Fuller St.. Everett. Mass.

50 VELOX reprints. $1. Suburban Studio. 1410-S Bond. Rockford. Ill.

EKTACHROME to 4x5 expertly processed. Quick service. 25c per sheet. Goshen Color Laboratories. Box 564. Goshen. Ind.

SENSATIONAL Introductory Offer! Send snapshot or negative. this ad and 10c. We'll send you a beautiful 7 x 5" enlargement! Or. Kodak roll developed and printed (with free coupon) only 25c; or 8 Giant prints from roll. 30c. Reprints from negatives—any quantity—regular size. 3c; Giant size 4c. Candid rolls—36 exp. 35mm developed. vaporated. enlarged to 3 x 4. $1.00. 18 exp. 50c. Free Mailers. Free Premium offers sent on request. American Studios. Dept. 365. Lacrosse. Wisconsin.

104 PHOTOPRINTS, PHOTOCOPIES

PHOTOSTATS. letter size. 25c. Overnight service. Mimeo. Box 33. Forest Hills. N. Y.

90 MOTION PICTURES, SOUND EQUIPMENT

GUARANTEED Fresh anti-halo outdoor movie film! Weston 12 Daylight loading! Processing free! Three spools Double 8mm. $3.45! Six single 8mm for Univex. $4.60! Postpaid! Catalog. ESO-S. 828-A. West 39th. Kansas City 2. Missouri.

LEARN movie projection. management. Free Catalog. Theatre School. Elmira. N.Y.

DISCOUNTS! 8-16mm Films. Equipment. Catalogue 3c. Towers. 935 North 40th. Philadelphia 4.

RARE 8-16mm. Silent-sound films. International. 2120 Strauss. Brooklyn. N. Y.

BEAUTIFUL Kodachrome Slide and Lists 25c. Slide Supply Service. 3111 West Tuscarawas. Canton. Ohio.

MOVIE Cameras! New Lektro Junior 16mm electric. magazine-loading. F3.5 anastigmat lens. viewfinder. battery. cord. tripod socket. Complete. Ready-To-Operate Only $59.50. Money Back Guarantee! Free booklet. Magazine film. panchromatic for this camera—$2.50. Free processing. Fotoshop Inc.. Room 63. 18 E. 42 St.. New York City.

MOVIE Film At Tremendous Savings! Kodak Super X. Gov't stock. Tested—Guaranteed! 16mm 100 ft. $2.95; 50 ft. Magazine $2.50; Double 8mm 25 ft. $1.65. Super XX. 50c add'l. each roll. Free processing. Fast service. Photo-Surplus Sales. Box K-5. 12 Duane St.. New York City.

MOVIE Films 100' 16mm $2.25. three rolls $6.00. Magazine Color $3.50. Ambassador. 479-A Quincy Street. Brooklyn 2. N. Y.

CHILD Is Born By Caesarean Delivery. Project outstanding movie production free. Send postal card. Movies. Hamilton 27. Ohio.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue. (sample film 10c). Garden Film. 317 West 50th. New York 19.

RENT 16mm. sound films 50c reel. Large selection; free catalog. U. C. Film Service. 128 Chestnut Street. Roselle Park. N. J.

NEW Caesarian Delivery—Latest Hospital Technique now available 400 ft. Kodachrome—B & W 8mm and 16mm. Sherwood Pictures. Dept. K. 1567 Broadway. Bklyn 7. N. Y.

ART model films 16mm rentals exclusively. adults list. Enclose stamp. Revere Films. Box 1051. Detroit 31. Mich.

MAGAZINE 16mm 50' E.K. Super X panchromatic. Guaranteed. Processing included. $1.99 postpaid. Fischer Photo. 1729 N. Mobile. Chicago 39. Illinois.

EXCLUSIVE Home Movies Select Films. Write for Free List. Home Pix. 1674 Broadway. New York 19. N. Y.

FILM—Movetone is back. It's Weston 12. nonhalation. Free processing—100 ft. 16mm. $3.25; 25 ft. Double 88. $1.50. Bulk film without processing—100 ft. 16mm. $2.25; Double 88. $2.45. Free Circulars. Fromader Genera. Davenport 5. Iowa.

HOLLYWOOD Films. Color sample. $1.00. Catalog 10c. Stone. Lunenburg 10. Mass.

"THE World's Greatest Passion Play". All sizes. Rent or Purchase. Write Hemenway Film. 33 Z Melrose St.. Boston 16. Mass.

UNUSUAL movie. "Temptation" featuring beautiful models. 100 ft. 16mm $5. 50 ft. 8mm $3. COD's accepted. Fine Arts. Box 2084. San Antonio 5. Texas.

ART Films: 50' 8mm. $2.75; 100' 16mm. $6.00; 100' 16mm sound. $7.50. Catalog Free. 16mm Viewer with 150 Art Figure Poses. $2.00 postpaid. Bruno 2¼x3¼ Art Negatives. 6 for $3.00 postpaid. Beautiful 35mm Color Art Slides. 10 for $3.50 postpaid. Seconds. 25 for $3.95 postpaid. Fresh Ansco 20 exposure 35mm Color Film. 3 rolls for $4.50. plus 15c postage. Gamerman's. 3808-C Eastern Avenue. Baltimore 24. Md.

16 35mm SILENT. Sound Films. Bedner. 5300 So. Talman. Chicago.

Copyrighted material

WE Buy, Sell, Rent, Exchange Home Movies. Details for dime. Midland, Box 429, Oak Park 3, Ill.

GUARANTEED Film 25 ft. Double-8 $1.45. 100 ft. 16mm $3.45. Processed Free!! Weston 50! MK Photo, 451 Continental, Detroit 14, Mich.

PROCESS your own movie film. Literature. Duro Products, 1519 N. Eggert, Eggertsville 21, N. Y.

16MM SOUND. Gags and Gals Musicals, Buster Keaton Comedies, others. Jubilee, 723 7th Ave., New York.

8 AND 16 mm movie films, fast machine processing service, bulk film, free circular, Atlantic Films, 28D North Fourth St., Reading, Penna.

AMERICAN Legion Parade 8 and 16mm Silent and Sound. Musicals. Cartoons. Dramas. Westerns. 3c Stamp for Catalogue. Excel Home Movies, 634 Acklin, Toledo 10, Ohio.

IMMEDIATE delivery of 16mm Sound projectors. Large stock of Castle, Official, Nu-Art and Pictorial films. Soundies Comedies, 16mm Ansco color film. Used 8mm, 16mm Sound. List Titlers. Splicers. Editors. Rewinders. (Home Movies. 41 South Fourth Street, Allentown, Penna.)

JOIN World's largest cinematographic society. Details free. International Cine Society, Suite 218, 6770½ Hollywood Blvd., Hollywood 28, Calif.

MAKE big money selling our new sensational films. Send for sample movie and free wholesale price list: $10.00 16mm sound: $7.50 16mm silent: $2.50 8mm. Standard Pictures Corp. Universal City, Calif. Dept. B.

92 MUSIC, MUSICAL INSTRUMENTS

WESTERN, Popular Records—late numbers 29c. Catalog 3c. F-L Shop, Box 19S, New York 35, N. Y.

INSTRUMENTS for less and still the best. Send for Bargain Catalog. Harden's Musical Merchandisers, Marion P., Ohio.

PHONOGRAPH Records Cheap. Catalogue. Paramount, SH-313 East Market, Wilkes-Barre, Penna.

DIAL-A-Chord, the new piano key-board sensation. Beginners learn to play attractive piano in a few weeks. Also very essential for the advanced student and composers. $5.00. Literature free. Nelson Enterprises, 102, 1651 E. 93, Cleveland 6, Ohio.

VIOLIN making book, patterns supplies. Fraser, 2025-P Stark, Saginaw, Michigan.

SWISS Musical Units $3.25. Music Boxes, 131 West 42nd, New York 18, N. Y.

SAVE 30% to 60% when buying Drums, Trumpets, Clarinets, etc. Rayburn, 267 Huntington, Boston.

122 SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

SONGWRITERS, Songs Published Monthly. Advance Royalty. Send your songs or poems today for our exciting offer. Hollywood Tunesmiths, Dept. 10F-C, 1537 N. Vine, Hollywood 28, Calif.

POEMS Wanted For Musical Setting. Send poem for free examination. Five Star Music Masters, 646 Beacon Bldg., Boston.

"SONGWRITERS: Send Poems for Free Examination and Outstanding offer. United Music, 116, Salem, Indiana."

POEMS wanted for musical setting. Send Poem for immediate consideration. Hamann Service, 626 Manhattan Bldg., Milwaukee, Wisc.

SONGWRITERS Investigate Outstanding Service. Song Poems, Melodies. Publishers List Free. Song Productions, Dept. L-11, 113 W. 48 St., New York 19.

SONGWRITERS! Honest Outstanding Music Writing Offer. Dick Reynolds, Leonard, Texas.

SONGWRITERS: Protect your ideas! Hold your songs, poems! Beware of Songsharks! Free collaboration and publishing. Enclose 10c to cover mailing of application and booklet, today. The American Society of Songwriters, Appln. Dept., P. O. Box 1126, Boston 3, Mass.

SONGWRITERS. Send us your Songs and Song Poems. Hollywood Composers write melody Without Charge. Lead Sheets and Records furnished. Send song material Today for Free Examination. Write for details. Cinema Song Company, Dept. B51, Beverly Hills, California.

MUSIC set to poems. Any subject. S. Bacon, 370 W. 126 St., New York 27, N. Y.

SONGWRITERS—Protect your songs. Get the facts first. Free booklet, attractive offer. Song Service, 331-J West 46th, N. Y.

'LET Broadway Arrangers Compose Your Melodies Commercially. Gardner's Music Service, 1650 A-Broadway, New York 19, Suite 701.

112 RADIOS, SUPPLIES & EQUIPMENT

MAKE Simple, Tubeless, Batteryless, Distance-Getting Crystal Radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S, Clinton, Mo.

U.S. Signal Corps Featherweight Earphones $1.00. Radio Service men and experimenters send stamp for our giant radio catalogue. Save dollars. United Radio Co., (100-V) Newark 1, N. J.

RADIO & Television Catalog—Free! Money saving prices on Radios, Hard-to-get Parts, Record Changers, Wire and Disc Recorders, Amplifier Systems, Tubes, Books, Amateur and Test Equipment. Write today! Radionic Equipment Co., Dept. 1511, 170 Nassau Street, New York 7, N. Y.

8" RECORDING disk and cutting needle $1.00. James Butler, 654 Kings 6 Walk, Brooklyn 33, N. Y.

RADIO book:—"Everybody's Radio Manual." Tells how to service all radios at home. 256 pages, 216 pictures. DeLuxe edition. $1.49. Popular Science, Dept. 117-C, 353 4th Avenue, New York 10, N. Y.

BUILD "Loudest" Crystal Radio. Instructions and Crystal, 25c. Amoroses—Route four—Richmond, Virginia.

CRYSTAL or Razor Blade Radio, make one. Headphones $1.25. Head Bands 50c. Complete plans 25c. Send cash, check or money order. Nico Supply Co., 1770 Walnut, Philadelphia 3, Penna.

HALLICRAFTERS, National, other radios wholesale. Terms. Write. Henry Radio, Butler, Missouri.

200 SERVICE Hints and Short Cuts in Radio Repairing $1.00 prepaid. Chapman Radio, 805 So. 20th Street, Birmingham, Alabama.

RADIO Controlled Garage Door Opener—Works from button in car. Complete plans $1.00. Chapman Radio, 805 So. 20th Street, Birmingham, Alabama.

FM Television antennas, ham parts. Bargain List. Wholesale Supply, 347 Lunenburg St., Fitchburg, Mass.

SPEAKER Pillow—Dynamic—Connects to any radio. Simple instructions included. $12.50 list. $6.00 Prepaid. Chapman Radio, 805 So. 20th Street, Birmingham, Alabama.

CLEARANCE Prices! Scarce electronic parts. Technicraft, 1156 Commonwealth, Boston 34, Mass.

24 PAGE plans "18 Crystal Sets" (SW record 5800 miles), including "Radiobuilder." Catalog—25c. Laboratories, Eye-t, San Carlos, California.

25 YEARS Experience radio repairing at your fingertips. I've repaired 45,000 radios and have perfected system you can follow step by step. My methods are far simpler than any course published. Requires no calculations. Total price $1.00 postpaid or C.O.D. Moneyback guarantee. Ross Radio Company, 14615-B Grandriver, Detroit 27, Michigan.

BOOKS on radio-electronics supplied by mail. Servicing, home study, math, electricity, operating, television, etc. Postcard brings free illustrated catalog plus details of free offer to new customers. Nephews Publishing Company, Dept. P11, 300 Pacific Street, Brooklyn 2, N. Y.

AMERICA'S Best Buys. Radio Tubes 29c up. Free Bargain lists. Potter, 1314 McGee, Kansas City 6, Mo.

TELEVISION Opportunity knocks now. See Marlowe Ad under Profitable Occupations.

24 BUSINESS OPPORTUNITIES

$25 WEEKLY working two hours daily. No canvassing. No Manufacturing. Lycke, Box 2471, Cleveland 12, Ohio.

OPERATE profitable home business selling merchandise by mail. Fast sellers. Large profits. Powell Service, 5713 Euclid, Cleveland 3, Ohio.

RECAST old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

BOOKKEEPERS—Operate your own simplified "Dollar-A-Week" Bookkeeping & Tax Service. Full or spare time. Details free. Ellis, Box 203, Cedar Grove, N. Car.

MAIL Order Business course shows you how to make money, spare or fulltime. Teaches professional mail order technique—not penny-snatching schemes. Fascinating 100-page illustrated Success-Catalog Free! Write—Nelson Company, Dept. 4-01, Chicago 5.

HOW and Where to obtain capital. Particulars free. Star Service, Wapakoneta, O.

SPECIALTY Manufacturing, the big money business that can be operated anywhere, start on a very small capital; we supply dependable formulas and complete instructions; get interesting Free booklet, "Money-making Opportunities in Specialty Manufacturing." Howard Robinson, Ph. G., 1300-B S. Ohio St., Sedalia, Mo.

I MAKE big money in the mail-order business. You can do the same at home with copyrighted system. Write me I'll tell you how. F. Little, RD #1, Glenshaw, Pa.

137 PLANS to make money local, mail order. Particulars free. Elite Co., 220-A Grand St., N. Y.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

MAKE money casting new line Metal Toys and Novelties. Latest 1947 Scale Model Autos. Original Ashtrays. Savings Banks. Water Pistols, etc. Big wholesale and chain store orders now being placed at high prices assures big business and profits. Spare or full time. No experience or special place necessary. Write for details and illustrations of patterns needed. Metal Cast Products Co., Dept. E, 1696 Boston Road, New York 60, N. Y.

"SELL By Mail! Books And Novelties! 35 different items! Large Profits! Catalog free. Elfco, 432 N. Wells, Chicago 10.

GO in magazine renewal and subscription business. Pays big—Repeat orders come automatically. Supplies furnished. Get free catalog and commission list. Write today. McGregor Magazine Agency, PS-10, Mount Morris, Ill.

START Mailorder Bookshop—Everything furnished; publisher cooperation. 25c brings booklet, exclusive setup, samples, exciting ideas. General Publications, Ossining 1, New York.

START home business making statuettes, plaques, artificial marble flooring, liquid marble, flexible molds, metallizing baby shoes. Amazing profits. Folder Free. Creative, 236-M, Winnetka, Illinois.

START Your Own Advertising Business on limited capital. No experience needed. Make 400% on investment. No matter where you live this is your opportunity to build a fast growing business. Mail $2.00 for complete plans. C. R. Vail, LaGrange 2, Indiana.

COIN Machines earn big money! Machines are now available at $11.75 that can earn as high as $7 weekly profit. Place machines in stores, hotels, filling stations, etc., and your income starts immediately. Routes can be operated in spare or full time with no experience needed. We'll tell you how and send you a catalogue describing our nut, candy, gum and postage vendors, also scales, amusement games, etc. Write immediately to Parkway Machine Corp., (Z) 623 W. North Ave., Baltimore 17, Maryland.

MANUFACTURE Yourself: Cleaners, Polishes, Cosmetics. Formula Catalog free. Kemico, 10, Parkridge, Ill.

CHOOSE Your Own Future, with importing-exporting. Sell-buy abroad make 1,000% profit. Master world trade principles quickly, easily. Send $1 for two Bulletins supplying addresses of hundreds overseas firms seeking connections. Money refunded if unsatisfied. Benko, 246-S Fifth Ave., N. Y. 1.

HOW To Set Up and Run A Mirror Shop! Resilver Mirrors. For Price write—John Sprinkle, V90, Marion, Indiana.

REMNANTS, Amazing Values. Good Profit. Write B & M Textiles, 415 E. 26th St., Paterson 4, N. J.

LIQUID Rubber for making flexible molds. Sample bottle 25c. Plaster hardener, quart $2.00. Free literature. Chaney, 1130 East 16th Street, Jacksonville, Fla.

FELLOW Workers—Down with Bosses—Start own business—Be Independent—Booklet describing 137 Tested Plans, free. P. Padney, 307 York St., Jersey City, N. J.

BOOKKEEPING Service-by-mail. Comprehensive, nation-wide Survey shows why and how of phenomenal growth. Free details. Research Dep't, Box 33, Forest Hills, N. Y.

YOUR ideas or patents manufactured. Send us your ideas for appraisal. National Tool & Die, P. O. Box 1285, Hartford, Conn.

"HOW to go into business for yourself." Excellent Book. $1.00 postpaid. 26 North 11th Street, Toledo, Ohio.

YOUR own plastic business at home. Produce costume jewelry, novelties, statuettes. Liquid Plastic, liquid marble. Flexible molds. Write for free book. American Trades, Box 89-B, Cincinnati 29, Ohio.

AMBITIOUS. Sell Xmas Cards, Stationery. Big Profits. Colored Catalog Free. Beacon Hill Greetings, 115 Chauncy, S. Boston, Mass.

Copyrighted material

TYPEWRITER Repairing instructions, standard typewriters. Webers', Box 1008, Canton, Ohio.

FREE—Get The New 1948 wholesale Shell Catalogue absolutely Free. This exciting 28 page booklet displays our complete line of wholesale Shell Supplies—Shell Kits to make your own shell novelties and attractive jewelry. Shellcrafters, Novelty makers, and beginners will be delighted with our wide variety of shells. Send Now for Free Wholesale catalogue. Sun Shell Supply, Box 2549-A, Sarasota, Fla.

MAKE Plastic Jewelry. Free information. Attler Company, 23-60 29th, Long Island City 5, New York.

START your own Electroplating Business. Highly Paid. Uncrowded Field. Learn at Home. G. I. Approved. Send postcard for Free Electroplating Booklet and Proof. Plater Hyde, Room 523, 432 "F" Street, San Diego 1, California.

START a home business in spare time. Make extra money. Experience unnecessary. Literature free. Ellmar Service, Muncy 3, Penna.

BABY Shoes preserved. Formulas, instructions, $1.00. Novelty Bronzing, Box 56, Hyde Park 36, Mass.

QUICK Money! "Repairing Car Batteries." At home! Easy too! Write, Batteryman, Grand Junction 1, Colorado.

WOULD you pay 3%—first $350 made? Color-illustrated book "505 Odd, Successful Enterprises" free! Some offer occasional "day off." Work home. Expect something odd! Pacific-U, Oceanside, Calif.

RAISE Earthworms. Instructions $1.00. W. Huffman, 391 Pleasant Lake, Rives Junction, Mich.

OPERATE profitable mail order business. Write, Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

RUBBER Moulds for casting novelties. Latex for making Molds. Use thoroughly tested and approved products. Eastern Latex Laboratories, Box 153, Mattapan 26, Mass.

FLEXIBLE Molds to order, also originals. Professional course manufacturing molds and cast novelties. Latex, lacquers, flocks, flocking equipment, supplies. Plastics, Box 1574, Boston 4, Mass.

MAKE profits in mail order business. Astounding plans describing method sent free. Jimton Service, Lock Box 1373-B, Mobile 8, Ala.

EXCLUSIVE Distributor. Plasticized beauty-protection for auto finishes. Used like polish. Must fin. own stock. Plasticize, 2254 NW 62nd St., Miami, Fla.

DOLLARS daily! Cleared $1,900 in two months by mail! Write immediately! Loeb, D-11, Silverton, Cincinnati 13.

MANUFACTURE costume jewelry at home for profit, hobby, therapy. Free wholesale supply catalogue. Instructions. Florida Supply House, Bradenton, Florida.

METALLIZE Baby-Shoes. New Ideas. Particulars Free. Krall, Box 8087, Pittsburgh 16, Penna.

CO-PUBLISH "The Target". Dollar starts you. Coffey, 62-G East Hillcrest, Dayton 5, Ohio.

WHITE Liquid Rubber for making flexible molds! Quick drying! Safe! For home, classroom, or industry! Quart $2.00. Gallon $5.95. Full instructions! Beginners booklet on molding and plaster casting 25c. Free with order! Plastercraft Supply Company, 1406 East 43rd Street, Cleveland 3, Ohio.

TYPEWRITER Repairmen urgently needed. Earn $40 to $50 weekly spare time. Our easy to learn home study course teaches how to repair typewriters. Write for free information. Houston Typewriter Repair Service, P.O. Box 5357, Houston 12, Texas.

LEARN Piano Tuning, Repairing, at home. Tremendous field! Piano parts, tools furnished. Established 1935. Empire School of Piano Tuning, 606-A East University Ave., Champaign, Ill.

$126.50 WEEKLY, guaranteed. Mail $1. Stannette, 277 Madison St., New York 2.

CLASSIE Novelty, large profits dime. Martin, PS, 57 Hart, New Britain, Conn.

CONVERT hand mowers to power mowers—sell the handy-dandy lawn mower conversion kits. Easily installed on any make mower in 3 hours. Used with any small gasoline or electric motor (Maytag, Power Products engines) in stock. Quick delivery. Kits can be purchased with or without engines. Fits 16 to 20 inch mower. Dealers Wanted. Write for Details. Le Claire Manufacturing Co., Le Claire 2, Iowa.

OPERATE Profitable Mail Order Business. Splendid opportunity. For details write J. Kavas, 54 Seigel Street, Brooklyn 6, New York.

$$$$$ FOR Buyer's Service Members. Catalog $1. Dasco, 199, Moosup, Conn.

DEALERS Wanted. Gavitt's Herb Tablets, fifty years. Laxative, $1.00. Send for 25 cent box free. Gavitts, Topeka, Kans.

"MAILORDER Fundamentals". Mail-order beginners. $1.00. Mecca, 30 West Washington, Chicago 2.

ELECTRICALLY Inclined Men. Amazing illustrated literature free, proving $100-$250 weekly possible, installing, maintaining fluorescent lighting. Earn $5-$10 hourly operating your own fluorescent sales service, and fixture fix-it shop. Make beautiful lights (including ballasts) for 50c each and less. Free sample materials. Write, Willis Fluorescent Service, 101 York Street, Brooklyn 1, New York, Dept. A.

START a clock shop while clock repairing is booming. Our easy to learn home study course with pictures and illustrations teaches you how to repair all kinds of clocks. Information free. Houston Clock Shop, P.O. Box 5086B, Houston 12, Texas.

DO it with Sea Shells. Attractive Jewelry, Novelties. Big Profits. Instructions. Supplies. Wirts, 1429-56th Avenue, Oakland 3, Calif.

"INVESTIGATE Mail Order or Home Business. 140 new ideas. Write Marshall, Box 655, Centralia 14, Washington."

WANT to enjoy good things in life? Then, start something on your own and use our office as your office. Beginners, $7.30 yearly. Firms, $14.60 yearly. Remittance payable. Co-operative Office Service, 126 Lexington Avenue, New York 16.

GET 400 Money making ideas, plans, formulas, Schemes. Folio Free. Formico Prod., Box 572, Dayton, Ohio.

UP to $1500 yearly selling by mail in spare time interest you? New ideas and plans every month. Details free. Idea of Month Club, Box 118-B, Baltimore 18, Md.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers, Box 23, Pawtucket, R. I.

NEW Low Prices—Super X Molding Latex. Liquid Sample 25c. Literature and Sample Free. W. Wooley, 115-B Donald, Peoria, Ill.

SPECIAL Molding Latex. Free Samples. Universal, Box 1076-B, Peoria, Ill.

MAKE Rubber Stamps—Plaster Novelties—Metalize Baby Shoes—Silver Mirrors. Catalogue of "20 Ideas" Free. Universal, Box 1076-B, Peoria, Ill.

BABY Shoes. We metallize hundreds and will teach you how. Send card. Schoettle, Friendship 4, Ohio.

MFG. will sell soap processing machine, furnish formula, train buyer. One machine will be sold in each city. Splendid opportunity. $600 investment. Cross Company, 1817 South Kingshighway, St. Louis 10, Mo.

RUBACREAM! Natural Rubber Latex! Makes molds quicker! Thicker! Free Sample convinces! Castcraft Studios, 509-S Fifth Avenue, New York 17.

INDUSTRIAL sites Free. City property with clear title. Locate in Northwest Florida's year round climate. Chamber of Commerce, Lynn Haven, Florida.

UPHOLSTERING Start your own Shop beginners Kit and Instructions. Write Wynn and Graff, 5116 Charlotte, Nashville, Tenn.

"EVERYBODY Likes Candy"—Learn to manufacture in a professional manner. (Our 37th year.) Ragsdale Candies, #7, East Orange, N. J.

METALLIZING baby shoes makes you money! Learn this simple, profitable business from Nationally recognized authority. Get professional results with professional "know-how"! Free particulars. Joseph B. Kushner, Metal Finishing Consultant, Stroudsburg, Penna.

CONSULT—Mitchell Engineering, 6430 Evans, Chicago 37, Ill. Electrical; Mechanical; Product Design; Patent Engineers.

EARN Money With Colorful Handmade Jewelry—free circular tells how! Nothing complicated—dollar starts you! Plastic Works, 712 Kimball, Danville 2, Ill.

AUSTRALIA Wants Veterans including merchant marine eligible Aust G.I. benefits; passage part paid unlimited jobs full particulars one dollar. Lee, Box 245, San Anselmo, Calif.

X THREE one thousand size Billie Boy Trade Board's 5c 10c 25c seller's. $400.00. Pay Back $320.00. Profit $80. List Price $12.00, special Only $6.00, it is the fastest seller in the country. Wire. House of Novelties, Chicago 49, Ill.

HOMEWORKERS—$50.00, $75.00, $100.00! weekly "Castwood Plastic" Gifts, plaques novelties; Material, molds, instructions furnished (Sample Outfit) Rubber scottie mold, woodcut ashtray, 1-pound castwood plastic with big list, supplies $1.00 postpaid. Standard Art Products, 1416-R4 Fletcher, Chicago.

MAIL Order Business your opportunity. "How To Build Your Own Mail Order Business". Beginner's Idea-Book Tells How. Quarter, Postpaid. Satisfaction warranted. Gilchrist, 622-S, Mass. Ave., N.E., Washington 2, D. C.

UNPAINTED Marblite figurines and Plaster plaques. Free price list. Bijou Novelties, 1795 Stillwell Ave., Brooklyn 23, N. Y.

AMAZING Profits Possible in Mailorder! Moneymaking secrets revealed. Folder Free! Brydenn Enterprises, Columbus 16, Ohio.

SELL By Mail. Inexpensive Course tells how. Details free. McKitrick, Box 58-S, Mt. Vernon, Illinois.

$46 FROM Square Foot Plywood; Jigsaw necessary. Write; Woodart, Bridgewater, Mass.

"OPERATE Profitable Mail Order Business with $5. For details write: George K. Arnold, Somerset, Ohio.

COMPLETE Electroplating outfits for hobby or profit/Set up your own small business for $20.50. Write, Fisher Mfg. Co., Box 178, Galion, Ohio.

COLORADO'S Fabulous Oil Boom attracts thousands. You too want shot at $1,000—$5,000—$20,000 on investment of $140? Want your profits in lump sum? Learn how Vincent put in $1500 and found himself $76,000 richer in 8 weeks. I'll attend to everything. Write today. Dyer-PS, 1835 Champa, Denver, Colo.

DIRECT Factory Agents for fast-selling, fine commercial popcorn machines. Nationally advertised. Sales Leads furnished. Excellent profit. Viking Popcorn Machines, Inc., 114 W. 18th, Kansas City, Mo.

WOODWORKERS—Earn big money with your shop. Enormous demand. Uncrowded field. Amazing facts free. Stafford, 708-G Rawlings, Carbondale, Ill.

"START profitable business with little or no capital. Particulars Free. Jim Herbert, 1800 Inwood, Jacksonville 7, Florida."

OPERATE Profitable Mail Order Business. Splendid opportunity. Details. Sheley, 32 Frank, Dayton 9, Ohio.

OPERATE America's most popular low priced precision penny vending machine. Big profits. Be independent. Write for bulletin and prices. Stock shipments. Fielding Mfg. Co., Desk PS11, Jackson Michigan.

GET it for them wholesale. Be community buyer nationally-known merchandise: radios, refrigerators, washers, sweepers, typewriters, etc. Savings up to 50%. This pleasant easy work can earn up to $5000 year. Get details today. Kraft, Aurora 9, Mo.

CAPITALIZE on "Everybody's Smoking" by manufacturing guaranteed cigarette lighters. Big profits, easily sold, easily assembled. Trial order complete parts for three pocket lighters, and one table lighter, $1.00 postpaid. Storm-Proof Lighter Company, 126 Lexington Avenue, New York 16.

COMPOSITION Flooring—made in most colors. Lifelong, Soundproof, Resilient. Flexible Molds. Cast novelties, plaques, statuary. Big money—your own business. Catalog Free. Write—Bing Products, 88-B-3U Broad Street, Boston 10, Mass.

COLORGLAZED Concrete Pottery made without molds. New, low cost, patented method. Cemetery products, novelties, tiles, floors, etc. Basement leaksealing. Other money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, Minnesota.

IF you'd like your own, high income but easily learned office business, write for free details today. Cole Associates, Syracuse 2, N. Y.

MAIL Order Businesses, Franchises, Distributorships, bought and sold. Write for Free Bulletin of Exclusive Opportunities. Turnipseed, Inc., Box 681, St. Louis, Mo.

BIG Money In Vending Machines—Smallest capital start brings immediate profits that build permanent profitable business. Starting instructions free. Becker Vendors, 105-P Dewey, Brillion, Wisc.

BUYERS Wanted for plaster novelties. Painted—Unpainted. Retail—Wholesale. Write today for free information. Bing Products, 88-X7B Broad, Boston 10, Mass.

SAWDUST. Turn it into cash. Instructions 25c. Charles, 12EJ, Norwood, Ohio.

88 MONEY MAKING OPPORTUNITIES

ELITE Collection describes 137 money-making plans; local, mail order. Particulars free. Elite Co., 220-A Grand St., N. Y.

START Your own business! Big money manufacturing novelties, plaques, statuary. Free catalog. Write Bing Products, 88-B-3W Broad Street, Boston 10, Mass.

DETECTIVES Earn Big Money. Experience unnecessary. Particulars free. Wagoner, P-125, West 86th, N. Y., N. Y.

Copyrighted material

SEWING Machine Repairmen make big money lifetime. Start neighborhood shop. Complete repair manual, covering all makes, $1.98 postpaid. Money Back Guarantee. Sewmachine Serviceman, Hamilton 10-F, Ohio.

SCHOOL Seniors—Sell classmates America's most beautiful Graduation Name Cards. Largest selection. 40% commission. Outsells all others. Send for free sample kit. Printcraft, 1425 E. Elm St., Scranton 5, Penna.

"INCOME Tax Experts earn good money. Send $2.00 for instructions telling how to start this fascinating business. Townsend, 509 Commerce Bldg., Rochester 4, N. Y."

METALLIZE baby shoes. Further information free. Metal Crafts, 5501 Suwanee, Tampa 4, Fla.

36 PAGE Catalogs, Imprint circular plan. Sample, treatise $1.00. Lynch, 402-6 Hazlett, Baltimore 29, Md.

MANUFACTURE costume jewelry at home for profit, hobby, therapy. Free wholesale supply catalogue. Instructions. Florida Supply House, Bradenton, Florida.

EARN Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle (2), Wisconsin.

EARN Up To $2.000 year, inventing simple items. Special cash markets. Hendrickson, Argyle (8), Wisconsin.

MAKE Perfume, Make Money. Free book tells how. Lawson, 21 Joiner, Saint Augustine, Florida.

"THERE'S Big Money In Junk," and repairing Car Batteries! Batteryman, Grand Junction, Colorado.

PRIZE Contest Fans Reap Rich Rewards. Enclose 3c stamp. National Contest Bulletin, Box 2685-S, Miami 31, Fla.

WOULD You pay 3%—first $350 made? Color-illustrated book "505 Odd, Successful Enterprises" free. Expect something odd! Pacific-V, Oceanside, California.

AGENT or exclusive distributor for cigarette lighter manufacturer. MacGregor, Tahoe Valley 15, Calif.

WIN contest money. General Contest Magazine gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609-A East 5th, Duluth, Minn.

CASH In On Your Hobby! Make and sell beautiful, authentic wood carvings from inexpensive models. No experience necessary with new, amazing "Carvit" duplicator. Start your own business or make your spare time show a profit! Dumore Co., Dept. L-59, Racine, Wisc.

ELECTRIC Clocks are everywhere you go, buildings, homes, parking-lots, factories. Repairs increasing. Our easy to learn course with pictures and drawings teach You how to repair these clocks. Electronic Supply Co., Box 2350-B, Houston 1, Texas.

HOW to make $5.000 this Christmas. Catalog brings full details. Send $1.00. Brown's Business Service Co., 333 E. 95 Street, New York 28, N. Y.

CASH In Now with this tested Mail Order Profit Producer. "Advertising Tips On Selling By Mail" gives you a complete outline of mail order operation. Send your $1.00 now. Special Small Capital Mail Order Plan Free. The Brown Company, Box 1412, Wichita, Kansas.

BE Independent in your own profitable business. No manufacturing or stock to carry. Operate from your home. C. J. Alexander, 624 Walnut Street, Long Beach, California.

AUSTRALIA!!! Opportunities, Wages, Prices, etc. Complete Report by Ex-G.I. Migrants, $2.00. Box 3113, GPO, Sydney.

900% PROFIT. Stamping key checks, dog tags, Social Security Plates. Arrington's, LaGrange 5, Georgia.

MAKE Beautiful Seashell Jewelry! Scores of beautiful things you can make at home. No experience needed earn money selling what you make. (Buy Wholesale). Large Illustrated Catalogue including instructions 25c. Pace's, Box 279-G, Bradenton, Florida.

400 MONEY Making Plans, Ideas, Formulas, Success schemes. Folio Free. Formico Crafts, Box 572, Dayton, Ohio.

METALLIZE flowers for profit! It's new easy, sure fire! Free details; Joseph B. Kushner, Metal Finishing Consultant, Stroudsburg, Penna.

WE have Popcorn Machines From $79.50. Pop yourself a Fortune. Send Stamp. P.K. Sales Co., Cambridge, Ohio.

1947 GIGANTIC Directory of Opportunities, Advertisers Supplies, Sources, Trade Information, Mail Order Ideas, Products, Wholesalers. Valuable tips—just published! Descriptive literature Free. Wilkin & Co., Hillsboro 2, Ohio.

"100 ITEMS to make and sell at home." Holmes, Oaklandon, Indiana.

TESTED money makers. New book gives complete know-how for operating 70 practical plans. Start one or more now and cash in. Only 25c. Vigilant Sales, 6432-B Cass, Detroit 2, Mich.

59 FORMULAS, PLANS, ETC.

137 MONEY-making plans, also formulas for salable products. Descriptive booklet free. Elite Co., 220-A Grand St., N. Y.

"NEED Chemists? Products duplicated? Formulas? Analyses? Consulting Scientific Company, Swarthmore, Pennsylvania."

10.000 FORMULAS and Trade secrets. Free Literature. Stillmans, 555 Kingston Ave., Brooklyn 3, N. Y.

PUBLIC Service Testing Laboratories, Inc., 381 Fourth Ave., N. Y. 16 Save Money —Make Your Own Toilet Articles And Cosmetics. These and other formulas and trade secrets available as low as $1.00.

HOUSE Plans drawn. Free estimates. Sample blue print, Twenty-five cents. Hills, 1408 Jefferson Ave., Des Moines, Iowa.

400 MONEY making ideas. Formulas and Mfg secrets. Folio Free. Formico-NA, Box 572, Dayton, Ohio.

100 SINGLE ingredient formulas. 25c. Tes-co, Box 189-SG, Wilkes Barre, Penna.

106 PLASTICS

POLISH Plastics with Flame. Complete kit and instructions. Nothing additional needed. $2.00 postpaid. Barnett Specialty Co., 5104 Hollywood Blvd., Hollywood 27, Calif.

"PLASTICS—Sheets, rods, tubes, all colors; dyes, supplies; findings. Illustrated fabricating manual, prices, 10c. Lucite sample, 35c. Gem-O'-Lite, Box 686G, North Hollywood, Calif."

INTERNAL Carvings, Drills, Dyes, Jewelry Findings, Tools, Plexiglas, Masked Sheets 12"x12" 1/16"—$1.00. 1/8"—$1.25. 3/16"—$1.55. 1/4"—$1.85. Include 10% postage. Rods, Tubes, Dyes, Cements, Buffing Compounds. Free Listings. Craft Plastics, Somerville, New Jersey.

TEN Fascinating Detailed Plexiglas Projects. $1. Original Plasticplans. Box 181, Cincinnati 1, Ohio.

NEW liquid plastic. Clear, colors. Cast without heat. Embed flowers, insects, coins. Saw, drill, carve. Manual tells how. Send $3.50 for complete 20 project kit including one pound liquid Castolite, Castolite. Dept. M-24, Box 211, Kenilworth, Ill.

INTERNAL carved roses costume jewelry sets. $1.50 less findings. 2" cubes with roses. $2.00. Crystal Floral Novelty Co., Dept. S, Somerville, N. J.

MAKE money assembling our pre-fabricated plastic kits. Sample Kit 50c. Catalog free. Fabros, Box 156, Station F-2, Buffalo 12, N. Y.

METALLIZE plastics for profit! Free particulars. Joseph B. Kushner, Metal Finishing Consultant, Stroudsburg, Penna.

MAKING Money With Plastics. $1.00. G. B. Going, Box 1544, Muskogee, Okla.

"FORMALIN plastics casting supplies. Free descriptive literature. Sample kit $3.00 f.o.b., Formalin, Romeo, Michigan."

RE-NEW Leather and Leatherette—Make cloth into imitation leather with plastic discovery called Leather-New. Opportunity to make real profits taking care of sales resulting from national advertising. Write for Free sample of Leather-New covered material and complete deal. 704 Land Bank, AX, Kansas City, Missouri.

33 CHEMICALS AND APPARATUS

CHEMICALS-Lab. Supplies New Catalog 10c. Mel-Glo Chemical Co., 258 Fourth Avenue, Brooklyn 15, N. Y.

SPECTROSCOPE For Quick chemical analysis $3.00. Cutting Co., Box 457, Campbell 2, California.

LUMINOUS Paints will glow in dark. Six colors. Fairmount Chemical Co., 136 Liberty St., New York City 6.

FREE Booklet—"How to Build and Equip a Chemical Laboratory". Sanco, Box 613, St. Louis, Mo.

FREE Catalog: Chemistry, Physics. Tracey Laboratories, 1907 Harrison, Evanston, Illinois.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Complete supply service for correspondence school students. Send 3c for catalog. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, N. Y.

CHEMICAL Magic Entertaining, Mystifying, educational. Complete set 50c. Wholesale price $3.00 per dozen, 10 dozen $25.00. 100% profit selling friends. Dytex Chemical Co., Crary St., Providence, R. I.

FORMULAS, Sold, Tested, Chemical, Metallurgical Analyses. Consulting Service. Heat Treating. Freehold Testing Laboratory, Box 352, Freehold, N. J.

CHEMICALS, ounce quantities, apparatus, catalog 5c. Fleischer's Laboratories, Everett 49, Mass.

CHEMICAL Paper. Invisible writing, with instructions. 5c. G.P.O. Box 900, New York 1.

BOOK. Chemical catalog. 10c. Pilgrim Chemical. 348K Edith, Salt Lake City 4, Utah.

LEARN Chemistry at home, from the House of Winn. Home of Supplies for student Chemists. New idea chemical and apparatus outfits for Home Experimenting. Semi-Professional Microscopes and accessories. Send 10c for retail catalogue. Established 1931. John H. Winn, Dept. 611, 124 West 23rd Street, New York 11, N. Y.

SOMETHING New! Student chemists send 10c for catalog and free copy of N-1 "Know Your Chemicals" Series. Met & Co., 160 Hillside Avenue, Nutley, New Jersey.

HANDBOOK for Chemical Experimenters. Hundreds of Experiments; Illustrated, 50c. Experiment Booklet, 15c. Supply Catalog, 5c. Reading Scientific Co., Reading, Penna.

NEW laboratory Supply Catalog of Chemicals and apparatus. Contains over 5000 items with illustrations, 212 pages. Send 50c. Standard Science Supply Co., 1232 No. Paulina St., Chicago 22, Ill.

68 HELP WANTED

INTERESTED In Latin America & Foreign Employment??? $1 brings copyrighted Foreign Service Directory listing firms with interests in Construction, Oil, Mining, Aviation, Transportation by Personnel expert and Hot List of Companies hiring. Global Reports, P. O. Box 883, Dept. PS, Hollywood 28, Calif.

"ALASKA—The Last Frontier" offers thousands of opportunities. $1 brings Official Government Map and copyrighted Report with listing of firms in Fishing, Construction, Mining, Aviation, Lumber. Current information on Homestead Lands, Prospecting, Business. Hot List of firms hiring. Alaska Opportunist, P. O. Box 883, Dept. PS, Hollywood 28, Calif.

EARN Up To $480 Month part or full time keeping books for small firms. Simplified System. Write Tax-Saver System, Dept. M, Ft. Worth, Texas.

5 AGENTS WANTED

SELL Personalized soap. Name on every cake. Ideal for gifts. Get sample offer. Dunbar Soap, New Brunswick, N. J.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. G, Decatur, Illinois.

FREE! Latest issue Opportunity Magazine, Salesman's Guide. Inspiring, constructive. Shows how to earn money selling for others or in your own business. Hundreds postwar opportunities. Send name and describe what you have sold or are selling. Illustrated copy sent Free. Opportunity Magazine, 283 East Jackson Blvd, Dept. 18, Chicago 4, Ill.

"BIG bargains for big profits. Over 100 sensational values. Men's used suits $2.00, pants 35c, topcoats $1.25, Overcoats $2.00, shoes 20c. Experience unnecessary. Free wholesale catalog. Superior, 1250-A Jefferson, Chicago 7."

LICK After-war layoffs; Start own business; home, office. Booklet describing "Collection of 127 Tested Plans" free. Elite Co., 220 Grand St., New York.

GREETING Card Agents: "Line Up" with "Pines" for bigger, better and quicker profits. Rush name, address on postcard today. Box 32, Flushing 6, N. Y.

START Your Own Business on Our Capital. Always your own boss. Hundreds average $6.000 to $25.000 annual Sales. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. K-U-PSC, Freeport, Ill.

JUST Out! History of World War II. Huge Volume, Popular price. Authentic text. Official photographs. Big profits. Riverside Book Company, Iowa Falls, Iowa.

EXCELLENT Sideline for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also, make money with our line of Automobile Initials and Sign Letters. Free Samples. "Ralco", XL-Roxbury, Boston 19, Mass.

ADVERTISING Book Matches—Cash In On Political Campaigns—sell Union Labels matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash Commissions. Superior Match Co., Dept. P117, 7530 Greenwood, Chicago.

Copyrighted material

MAGIC Cleaner and laundry soap deal. Hotter than a firecracker. Big Profits. Sample free. Uko. 5007 Irving Park. Chicago.

MAKE Money Selling Genuine Leather Jackets. Prospects everywhere. Top quality, full cut, exclusive features. Big Cash Commissions. Also 250 styles fine Shoes. Sample Outfit Free. Consolidated, Dept. S-806, Chippewa Falls. Wisc.

AMAZING New Zipper Shoe sells on sight. Big profits for salesmen. Leads line 200 splendid styles. Territories open. Get Free Sample Outfit. Write Victor Thomas, Dept. V-822, Chippewa Falls. Wisc.

BE renewal headquarters for all magazines. Christmas gift sales starting now. Big profits. No experience. No capital needed. Free catalog tells how. Write: McGregor Magazine Agency, Dept. PS-4, Mount Morris, Ill.

AGENTS—Big Line Including Food Products. Fast selling premium and bargain deals. Low prices. Send card for big outfit offer with gift Ho-Ro-Co., 2726 Dodier, St. Louis 7, Mo.

SCHOOL Seniors—Earn 40% commission selling classmates America's most beautiful Graduation Name Cards. Largest selection. Outsells all others. Send for free sample kit. Printcraft, 1425 E. Elm St., Scranton 5, Penna.

AMAZING New Glow in the Dark House Numbers, Switch Plates, Decals, Pictures, Religious Articles, etc. Factory Representative wanted. Wonderful Opportunity. Free samples. Madison Mills, 303 Fourth Avenue, New York, N. Y.

PROFITS To 100% selling Xmas and everyday Greeting card assortments. Details and assortment on approval. Glorian (Dept 12) 515 East 45th St., Brooklyn 3, N.Y.

NO Money or experience needed. Spare or full time. Steady income writing orders guaranteed men's hose. Variety 20 styles. We deliver and collect. Liberal advance profit. 33% cash bonus. Write today for complete free sales outfit. Kentcraft, Dept. SS, 44 Court St., Brooklyn 2, N. Y.

SCHOOL Seniors: Sell classmates superb Craftcards for super profits. Write Craftcards, Box 235 (AH), Pittsburgh 30, Pa.

BIG Profits selling used clothing. Operate from home, auto or store. Men's Suits $4.00. Overcoats $4.00. Field Jackets $2.00. Ladies' Coats $1.50. Army Shirts $1.50. Other Big Bargains. Catalog Free. Kadetsky & Son, 702 Barber Street, Dept. 10, Chicago 7, Ill.

SELL Handkerchiefs, Xmas Boxed and Bulk. Stanchief, 491 Broadway, New York 12, N. Y.

BRAND New!! "Circline" Fluorescent sweeping country! Fabulous profits selling stores, offices, homes. Also exclusive Fluorescent table lamp. Complete line modern fixtures. Rush name for free sales kit, sample offer. Rose Co., 529JB South Franklin, Chicago.

"EASY Money, for Individuals representing Manufacturer of well-known, quality cigarette lighter. Unusually good proposition. For details send name and address to Box 57, Buffalo 21, N. Y."

SELL new-used clothing from home, auto, store. Men's suits $1.17. Leather Jackets 85c. Overcoats 62c. Dresses 17c. Ladies Coats 38c. Other Bargains. Catalog Free. S&N, 565A Roosevelt, Chicago.

MAKE More Money selling personal initialed individualized belts, buckles, cap badges, tie holders. 2000 emblems to choose. Big profits, whole or part time. Write today special outfit offer. Hookfast Specialties, Box 1425, Dept. 7, Providence, R. I.

SELL Delicious Candies, Nuts, Gum. Immediate delivery. Write Casterline, 2031-SB Sunnyside, Chicago 25, Ill.

STRANGE "Dry" Window Cleaner. Sells like wild. Replaces messy rags. Liquids. Simply glide over glass. Samples sent on trial. Kristee 115, Akron, Ohio.

SILVER Plating Liquid. Apply with cloth. Renews silverplated ware. Cleans silverplates, polishes, one rubbing. Genuine silverplate. Lasting finish by occasionally going over again. Won't wash, boil, brush off. Also silverplates on brass and copper. Female and male selling representatives wanted. Part time or full. Any age. Wonderful profits. Exclusive territory. Sells by showing and demonstrating. Retail and wholesale. NuProcess Products, Aurora, Ill.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

$1. STARTS you in business. Sell DeLuxe ties, 100% wool interlining. Costs you only $7.00 per dozen, you make $5.00 Dozen. Send $1.00 for special introductory offer two DeLuxe ties. Catalog complete line Free. Philip's Neckwear, 20 West 22nd St., Dept. P-16, New York 10.

DISTRIBUTORS Wanted For Unusual Products. Levine's, 15-S Boulevard Station, New York 59, N. Y.

SELL oil burners for kitchen ranges. Great demand—terrific profits. Oil Burner Supply, Box 327, Cambridge, Mass.

SELL Ultra blue stock signs to stores, 1000 slogans, comedy, general, religious. 7 x 11, cost 6c, sells 35c. Make money. Sample free. Lowy, 8 West Broadway, Dept. 328, New York City (7).

AGENTS Wanted for our Slot Machines and coin operated amusement games in every town and community. Sell to clubs and homes, or start a route. Webb Distributing Co., Dept. P40, 6 So. Kedzie Ave., Chicago 12, Ill.

AGENTS. Sell finest Food Products direct to homes. Successfully sold for 25 years. Big profits. Powerful combination sale plans make sales easy. Permanent repeat business. Samples furnished. Live territories open to Distributors. Mother Hubbard Products Co., 4139 Grand, Dept. PS, Chicago.

MAKE Money At Home Like I do. Write Immediately. Duffy, Covington, Ky.

AGENTS—Wagon Jobbers—direct salesmen, choice territories open for household product of merit. Good profit. Details free. Plastic Sales, 34-B Davenport, Detroit 1, Mich.

DIRECT Factory Agents for fast-selling, fine commercial popcorn machines. Nationally advertised. Sales Leads furnished. Excellent profit. Viking Popcorn Machines, Inc., 114 W. 18th, Kansas City, Mo.

TOP Profits. Plastic Table Covers, Raincoats, Aprons. Terrific demand. Star, 261 N. 5th Ave., N. Y. 16.

MEXICAN Bird Pictures, Handmade with Real Feather. Sample 25c. Importer C. Staff, 14960 Evanston, Detroit 24, Mich.

SELL Handkerchiefs, Xmas Boxed and Bulk. Stanchief, 491 Broadway, New York 12, N. Y.

TAKE Orders, We Deliver! Glamorous Reproductions of any picture on Beautiful Plastic Hardwood Plaques. Immediate Big Profits! Gotham Products, Dept. C, Box 5427, Philadelphia 43, Pa.

WOULD you pay 3%—first $350 made? Color-illustrated book "505 Odd Successful Enterprises" free! Proven! Work at home, office. Expect something odd! Pacific-W, Oceanside, California.

SOMETHING new in fire extinguishers. Red Comet Automatics. Company established 1931. All year job. Exclusive territory. Dealers earning up to $15,000. Write 502 Red Comet Bldg., Littleton, Colorado.

FAST Selling Carded Auto Accessory and Other Items, write Steele Plastics Co., Ashland, Ky.

WE pay you $25. for selling 50 boxes Xmas cards, 21 for $1. Also 50 & 25 for $1. Costs nothing to try, samples free. Victory Studios, Mt. Vernon, N. Y.

AGENTS—Make big money from now on, selling the sensational new low priced transparent Plastic Table Cloth Cover. Saves on laundry bills. Every woman a prospect. Sample swatches free. Carwell Products, 330-EZ South Wells, Chicago 6.

$221.90 IN One week—Unusual? Not at all! Just look at one week's earnings of these representatives. SWB $247.84, JRS $252.80, HMT $242.75, HC $252.93, HET $319.38, OP $442.40. Direct mail campaign brings hot leads right into your home. Remarkable product does part of 10 men's work—a "natural" during these labor problem days. Has perfect sales story—sells year 'round. As modern as radar! Free equipment offer! We extend credit, deliver and collect. No capital required—no experience necessary. You make big profit on first sale and full credit on repeat business. Every business, store, home, factory, etc., are prospects. Write John Porter, 2433 Indiana, Dept. 325, Chicago 16, Ill.

400 MONEY Making Deals, Plans, Formulas, Tips Schemes. Folio Free. Formico Co., Box 572, Dayton, Ohio.

OVER Hundred Firms Seeking representatives. Full address of the Companys. Will be sent to you for $1.00 send 4c Stamped addressed envelope. Andrew J. Balser, 695 Wooster Ave., Akron 7, Ohio.

MAKE $100.00 month on your spare time, everyone that carries keys is your customer. 10c a year for lost keys service, we will send directions how to get orders. Send us $2.00 for samples, if you are unable to sell them, return them, we will refund your money. Write today. Lost Keys Service, 111 W. North Ave., Chicago 10, Ill.

"IDEAL business stamping metal key protectors, social security plates. Information upon request. General Products, 11 No. Pearl (PS), Albany, N. Y.

ELECTRIC Barbacue Spit. Fits Indoor-Outdoor fireplaces. Big demand. Smith Agency, S-2010, Ex. Springs, Mo.

SELL Perfumes and Toilet Waters, large Commission. Write Drams Company, 213 Tenth Avenue, N.Y.C.

SELL!! Balloons, Combs, Specialty Merchandise. Carleton House, Distributors, Texas City, Texas.

A NATURAL! Big Money, selling new line one piece, Lace Plastic Tablecloths! Sizes to 54x108. Also Women's Aprons; Novel, Embroidered Cotton Pillow Cases. Free, "Interesting" details. Royalty, Box 748-L, Passaic, N. J.

TOP Quality Paint line available to established manufacturers agents calling on contractors, builders, industrial accounts, stores, etc. Attractive discounts. Exclusive territory available. Write Lasting Products Company, Baltimore 23, Maryland.

PLASTONE—Amazing new polishes for floors, furniture, autos. Beautifully packaged. Low priced. Whirlwind seller to stores, gas stations, homes, fast repeater. Big profits. Unconditional money back guarantee. Write for free samples offer now! Plastone Company, 2014 PS-11, Wabansia Ave., Chicago 47, Ill.

GOLD lacquered Window Sign Letters. Large Sizes Penny Each. New Foils. Absolutely Beautiful. Free Samples. Atlas, 544 W. 79th, Chicago 20.

BIG Profits: Sell 25 attractive Christmas Cards for $1.00. Wade, 130 Eureka St., Greenville, Miss.

"PRESSURE Cookers." Now available. Selling like wildfire. Amazing profits. Write quickly. Morris Mandell, Inc., 131-W W. 14th St., New York 11, N. Y.

69 HIGHGRADE SALESMEN

FREE—New 42 page Book Entitled "How To Become A Successful Direct Salesman", written by salesmen for those who want to become salesmen and earn up to $100 and more weekly. Send penny postcard. Specialty Salesman Magazine, Dept. PS-9, 307 N. Michigan, Chicago 1, Ill.

AMAZING daily profits, steady repeat business selling Colt's famous Foot-Balance Shoes direct. Exclusive features make selling easy. 216 styles! Experience unnecessary. Patented Foot-O-Graph assures accurate fitting. Free selling outfit. Colt Shoes, 601 C-11 Atlantic, Boston 10, Mass.

SELL Nameplates, Homes, Offices—Free sample. Whitney, 375 Buckingham, Oakville, Conn.

NEW Auto Accessory, $8.50 seller. Big profits. Write Aero, 4836-S Joy, Detroit 4.

ADVERTISING Book Matches—World's largest direct selling Mfgr. of advertising Book Matches offers opportunity for profitable year 'round selling; Every business a prospect; No Exp. needed to start; Full or part time; Factory service; Low prices for high quality; Repeats; Sales Kit Furnished. Match Corp. of America, 3433-43 W. 48th Place, Dept. N-12, Chicago 32, Ill.

SAVE coal. Demonstrate: Samples 100 Free test circulars, obtains profitable returns, $1.00 Prepaid. Refundable guarantee. Coalaid, Waterloo 5, Iowa.

POCKET Pal; the All Purpose Cutting Tool. Wagon Jobbers—Salesmen. Sell to retailers and jobbers. 50c seller. Steady repeat item. Exceptional profit. Sample 25c. Nelson Manufacturing Company, 222 W. Kellogg, St. Paul 2, Minnesota.

47 EDUCATIONAL AND INSTRUCTION

HAVE your own office! Many earn up to $5,000-$15,000 Annually. Learn credit-collection agency business by home study course. Experience unnecessary. Write for Free bulletin. No obligation. Franklin Credit School, Dept. 203-M, Roanoke 7, Va.

WELDING—Best Training in U.S. Complete modern equipment. Non-profit GI Approved. Write for free booklet. Hobart Welding School, Box P-1179, Troy, Ohio.

Copyrighted material

PREPARE for civil service examination. Pay for course after securing position. Write Free School, Kokomo, Ind.

"UNCLE SAM" Jobs! $1756-$3021 year. Men-Women. Prepare for next examinations. Vets get preference. 32-page Book on Civil Service Free. Write. Franklin Institute. Dept. P-23. Rochester, N. Y.

FREE — Correspondence course "Telephone Selling Technique"; Barrett. 7524 S. Racine Ave., Chicago 20. Ill.—Free!

VETERANS: Train for High paying positions in drafting. Specialize in Tool and Die. Machine Design. Architectural. Structural drafting. Limited Registrations. Send for free Bulletin. Accommodations and Part Time Jobs for out of town students. Cleveland Engineering Institute. 2325 Chester Avenue. Cleveland 14. Ohio.

GOOD "Used" self-instruction educational books on all subjects bought, sold, rented, exchanged. Satisfaction guaranteed. Complete information and 100-page illustrated bargain catalog Free! Write—Nelson Company. Chicago 5.

"MASTER Course in Hypnotism"—$2.00. (No Minors). Other rare courses and books —not sold in bookstores. Exciting illustrated folders, lists, circulars—25c (refundable first order). Ar-Ges Company, 790 Broad St., B101. Newark 2. N. J.

STANDARDS. Suggestions and Glossary for Engineers. Draftsmen and Students. 50 8½x11 pages For Only $1.50 prepaid. Monson Engineering Service, 4525 Bryan Place. Downers Grove. Ill.

USED Correspondence Courses and Educational Books Bought, Sold, Rented. Catalog Free. Educational Exchange, Henagar, Alabama.

COLLEGE Students! Complete Problem Coverage in Algebra. Analytic Geometry. Trigonometry. Differential Calculus. Over 150 problems, solutions each subject. Pass any examination, Classroom, Civil Service, Army, etc. Send $1.00 each book. 2 for $1.75. 3 for $2.50. 4 for $3.00 postpaid. General Data Co., 1938 A South 37th Street. Milwaukee. Wisc.

LEARN trigonometry better — sooner. Master method instructions one week free. $1 after. Other books. J. Ziemba. 6123 Orchard. Dearborn. Mich.

BUILD Electric Motor—Kit. Illustrated instructions $4. World. Box 81. Clifton. N. J.

MAGIC Shorthand and Typewriting course Home Study. Laramie Sales, 4800 S. Laramie Ave., Chicago. Ill.

CLINICAL Laboratory Technicians in great demand. We train you in your spare time, in your own home. You can practice while studying. Write for free catalogue. Imperial Technical Institute. Box 973-B. Austin, Texas.

SHARPEN Scissors for doctors. Complete instructions, $1.00. Sterling Service. Box 501A. Hopkins Road. Richmond. Va.

SUPERMEMORY Course helps you to remember facts, faces, figures, when needed. Send postcard. Thor Books CS11-Box 1210. Chicago.

VETERANS—Prepare for Postoffice. Railway Mail. Other Federal Examinations. 37 years experience. Write for details. Farren School. 20 Union Park. Boston.

LEARN Movie Technique. International Cine Society will help you. Details free. Suite 1218. 6770 Hollywood Blvd., Hollywood 28. Calif.

"JOB Seeker's Guide" gives latest pointers. Send $1.00 for this new fact-packed book by nationally known industrial executive. L. S. Van Denburgh, Box 201, Newark 1. N. J.

77 LANGUAGE OUTFITS

29 LANGUAGES by Linguaphone, Russian, Spanish, Portuguese—Direct Conversational Method for Mastering any language quickly, easily, correctly at home. Available under GI Bill of Rights. Send for free Book. Linguaphone Institute, 54 RCA Bldg., New York. CI 7-0830.

10 AUTHORS SERVICE

I WANT New Writers to cash hundreds of checks for $1 to $100, offered each month. The easiest way to write for pay. No previous experience necessary. Send for Free details. No obligation. Saunders M. Cummings, 467-S Independence Bldg., Colorado Springs, Colo.

25 BUSINESS SERVICE

MAIL Forwarded. 25c each letter. $2.00 Month. Banas. Box 285-D. Syracuse 1. N. Y.

GOOD "Used" self-instruction educational books on all subjects bought, sold, rented, exchanged. Satisfaction guaranteed. Complete information and 100-page illustrated bargain catalog Free! Write—Nelson Company, Chicago 5.

TO Whom It May Concern: We will represent you in all principal cities of the world. Representatives wanted. Will send you assignments immediately. James W. Farley. Citizens Building. Cleveland 14. O.

BUY for less. Enjoy buying advantages of huge corporations. Any item. Details free Kelly & Co., 9544-R Whitcomb. Detroit 27. Michigan.

WORRIED about business? Write "Small Business Services," 711 Alamo National Bldg., San Antonio. Texas. Modern business methods; psychological slogans. Inclose one dollar. Confidential.

30 CARTOONING, SIGN PAINTING, DRAWING AIDS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is Free; no obligation. Simply address Cartoonists' Exchange. Dept. 1911. Pleasant Hill. Ohio.

MAKE Signs, 9 complete alphabet pattern sets, 3 complete numeral pattern sets and catalog $1.00. Sign Letter Distributors, P.O. Box 101. Mineola, N. Y.

TALENT Test Free. American School Commercial Art. Box 8066. Dallas 5. Texas.

SIGN painting taught at home by an old master. Ben Kerns. Box 812. Greenville. S. C.

LEARN Showcard Writing. Fascinating Profitable Business of your own. No special skill needed. Free information. Sherwood Publishing Co., Irvington. 11-E. N. J.

STENCIL beautiful showcards without practice. Kwiksign Stencils. 30 West Washington. Chicago 2. Dept. T.

SIGNS made easily. Instructions and ten sets modern alphabets, numerals, patterns. Sizes up to eight inches. All for $1.00. Co-operative Business, 7 West Madison, Chicago. (2).

31 CHALK TALK STUNTS

CHALK Talks, Laugh Producing Program, $1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

136 TYPEWRITERS

RECONDITIONED Typewriters, Printing Devices, Office Appliances Supplies Dixiegraph, King, N.C.

93A OFFICE SUPPLIES & EQUIPMENT

TYPEWRITERS. all makes $17.50 up; New duplicators with supplies $13.50; New portable adders $12.95; ship anywhere; Typewriter Service. 118 Spruce. Wichita. Kans.

118 RUBBER STAMPS

3 LINES 40c. Pads 35c. Signatures $2.40. Print-Right. Wauwatosa. Wisc.

RUBBER Stamps—Printing. Literature, samples free! Lee-Vall Press, 1208 Edgemont, Indianapolis 23. Ind.

110 PRINTING OUTFITS, SUPPLIES

"PRINTOMATIC" Selffeeding Post Card Stencil Printing Duplicators $9.50 Up. Office Size Duplicators, Speedoprints, Hilcos, Excellographs $33.41 Up. Literature Free. Pittsburgh Typewriter Supply, 336 WE Fourth Ave., Pittsburgh 22, Pa.

PRINTING Presses, Type, Supplies, Lists 3c. Turnbaugh Service, Loysville, Penna.

INEXPENSIVE home-made printing press. Details free. Novelty Shop, Downsville, Louisiana.

MAKE Your Own Plastoplate printing cuts. Simple, easy process. Plastoservice, Argyle 2, Wisc.

PRINT At Home—Send 10c for Catalogue—Type, Presses, Supplies. Barnhard Co., 6 Columbia St., Newark 8. N. J.

PRINTERS Are Made! Details Free. Printers. 7526 Metropolitan, Middle Village. N. Y.

GOLD Imprints $3.25. Samples 10c. GPE. 8 Walden, Cambridge 40. Mass.

PRINTING presses, type, supplies. Send dime for complete illustrated printer's supply book, details and press samples. Kelsey, Inc., A-8, Meriden, Connecticut.

109 PRINTING, MULTIGRAPHING, ETC.

500 6¾ ENVELOPES $2.35. Mango. 553B South 20th. Newark 3. N. J.

BUY Your printing at wholesale! Sell others. Details free. Adams-PS, 30 West Washington. Chicago 2.

1000 BUSINESS cards printed prepaid $2.50. Reliable Print Shop, 901 E. Jefferson, Louisville, Ky.

"FINE Raised-Letter embossed personal cards. Only $2.99 Thousand. Geren, 403-A South Oakhurst, Beverly Hills. Calif."

DISTINCTIVE Printing — Stationery, Checks, Cards. Reasonable. Samples. Prices Free. Stumpprint. South Whitley 2. Indiana.

QUALITY Printing: Business, personal stationery. State requirements. Samples. Mero Products, 99 Morrison, Punxsutawney, Penna.

SEND 10c Now, for our 36 page pricelist—Refunded first order. McCall Press (PSM), 1326 South 27th, Omaha 5, Nebr.

1000 BUSINESS Cards $2.45 (postpaid) 1000 8½x11 Letterheads $4.95, Madison Printing, Madison, Ohio.

PRINTING Reasonable. Mail copy. Free Estimates. Berliner, 3581-3 Milwaukee, Chicago 41.

POSTCARD brings our samples, prices. Valley Print Shop, St. Elmo 7, Tenn.

1.000 ENVELOPES $4.75. Letterheads same. Johnson, Box 93, Lansdowne, Pa.

QUALITY Printing. Quick Service. Dollar Specials. Samples Free. Bowman's Press, 200-K Oak. Warrington, Florida.

200 TWO Color bond letterheads $2.50 postpaid. Thompson, Marysville 68, Calif.

ADDRESSOGRAPH Machines, Multilith "70", New but shelfworn, 40 @ $15.00 each; Electrofiles Machines, shelfworn, 9 @ $5.00 each; KRZAK, Pawtucket, R. I.

MIMEOGRAPH stencils—lettering, designs, varityped. We cut—you run. Mimeo, Box 33, Forest Hills, N. Y.

98 PATENT ATTORNEYS

INVENTORS: Without obligation, write us for information as to what steps an inventor should take to secure a Patent. Randolph & Beavers, Registered Patent Attorneys, 340-A Columbian Bldg., Washington 1, D. C.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

INVENTOR'S Guide free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

PATENT and Trade-Mark Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 413, 815-15th Street N.W., Washington 5, D. C.

INVENTORS: Learn how to protect your invention. The United States Patent Office advises the inventor to engage a competent, registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. Special booklet "Patent Guide for the Inventor" containing detailed information concerning patent procedure with "Record of Invention" form will be forwarded upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 72B-G District National Building, Washington, D. C.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skilful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorney, 143-L, Victor Building, Washington 1, D. C.

INVENTORS—Victor J. Evans and Co. has a staff of registered patent attorneys available to represent inventors in the preparation and prosecution of their cases before the Patent Office. Detailed information and the steps to be taken to obtain patent protection will be sent to you upon request. Victor J. Evans & Co., 241-M Merlin Building, Washington 6, D. C.

Copyrighted material

"Evidence of Invention." Labiner, World Building, New York 7.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

58 FOR INVENTORS

THE Inventor who believes he has a new and useful invention, and needs advice, should consult a competent registered patent attorney. Without obligation, write for full information on how to secure Patents and Trademarks. Randolph & Beavers, Registered Patent Attorneys, 340-E Columbian Bldg., Washington 1, D. C.

"INVENTOR'S Guide" free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

INVENTORS: Avoid unnecessary expense, Write for free booklet explaining how our Consulting and Advisory Service can assist you in deriving greatest profit from inventing. Institute of American Inventors, Dept. 30-A, 1926 Eye St., N.W., Washington 6, D. C.

INVENTORS: Learn how to protect your invention. The United States Patent Office advises the inventor, unless familiar with such matters, to engage a competent, registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. Special booklet "Patent Guide for the Inventor" containing detailed information concerning patent procedure with "Record of Invention" will be forwarded upon request—without obligation. Clarence A. O'Brien and Harvey Jacobson, Registered Patent Attorneys, 72A-K District National Building, Washington, D. C.

HIGHEST Royalties and cash for inventions when we market them. Free booklet without obligation. Universal Marketing Co., 126 Lexington Ave., New York 16, N. Y.

PATENTED, Unpatented inventions promoted. M. Joyce Humphries, 1424 Landtitle, Phila. 10, Penna.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-K, Victor Building, Washington 1, D.C.

I'D like to show you how I've sold my inventions—write for free literature—George Pearce, 47-P, Bartholomew Street, Peabody, Mass.

INVENTIONS Wanted—For development. Elo Development Company, 29-28 41st Avenue, L. I. City, N. Y. IR 6-6219.

INVENTORS—Free Service. Descriptions of your invention sent free to 1,000 mfgrs. No charge unless invention placed. National Industrial Chamber, 82 Beaver St., N. Y. C.

HOW to sell unpatented inventions. Charles Dimmick, 477B Adair St., Long Beach 5, California.

BRASS, Aluminum and Bronze castings made to your specifications. Send pencil sketch of parts wanted. Write today for prices. Sedlock, 2584 W. 25th Street, Cleveland, Ohio.

PRELIMINARY Search reported 2 days, excepting Saturdays, etcetera, copies included, $7. Fee sensible because search made painstakingly. Attorneys and Inventors Central Search Bureau, consolidated with Patent Engineer Nicholas Aabberly, 303 Woodward Bldg., Washington.

SMALL lot production. Aluminum castings; Stampings; Screw Machine. J and M Company, Burlington 2, Kentucky.

NEED technical assistance in chemistry or related fields? We offer unusual, economical, confidential, services for small plants and independent inventors. Write Parwin Services, Box 688, Newark, N. J.

FILE Patents yourself, information free. Birsh, 712 Manhattan Ave., Brooklyn.

INVENTIONS Wanted, Patented or Pending. Inventors Exchange (D), Hartford 1, Conn.

ATTENTION Inventors. List your invention with me for immediate sale. Have hundreds of waiting buyers. Highest prices and royalties paid. Free details. Leslie Buford Stratton, Patent Broker, Chicago Stock Exchange Building, Chicago.

75 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 1926 Eye St., N.W., Washington 6, D. C.

Unpatented. Write Adam Fisher Company, 183-A Enright, St. Louis, Mo.

SMALL Inventions wanted by manufacturers. I'll help you sell your invention. Write for circular. S. Hull, 7829 Euclid, Cleveland, Ohio.

"INVENTORS — Booklet "Self-Testing Your Patent Or Invention" free on request. Avoid costly mistakes, wrong markets. Direct Contracts, 11106-B2 Longwood, Chicago 45."

"CASH or Royalty Paid for acceptable inventions by manufacturers. Write—John D. & Son, Box 3213—PS11, 285 Howard, Bridgeport 5, Conn."

YOUR invention should be legally protected by a filed Patent Office application before offering for sale. Use my complete Patent Office application service and I will help sell your invention. Commission basis. Buyers waiting. Issued patents may kill value of your invention, have Patent Office search made cost $6.00 for report and copies of patents nearest yours. Protection forms free. Charles Morton, Patent Broker, Established 1919, 11 West 42nd Street, New York.

ATTENTION Inventors! Highest prices and royalties paid for new inventions, patented or unpatented. Have waiting buyers for every type of invention. For Immediate sales action, write The New York Patent Exchange, 131 West 42nd Street, New York 18.

99 PATENTS

INVENTORS: Test the commercial value of your patented or unpatented inventions, quickly and inexpensively. Write for free information. Institute of American Inventors, Dept. 30-B, 1926 Eye St., N. W., Washington 6, D. C.

100 PATENTS FOR SALE

PATENTED Tie Clip—for four in hand or Bow Ties, for Sale, Cash or Royalty. George Visas, 92 Orange St., Newark 2, N. J.

78 LEGAL DIRECTORY

PUZZLED? Digest of Divorce laws, 48 States $1. Liberty Co., 1265 Beacon, Brookline, Mass.

82 MANUFACTURING

MODELS small lot manufacturing, metals, plastics, etc., Millburn, Burlington, Ky.

87 MODELS, MODEL SUPPLIES

MOST complete Illustrated Catalog—"O-HO OO" Model Railroad Parts ever published. Send 5c for mailing. Selly, 1377 Gates Ave., Dept. 836, Brooklyn, N. Y.

MODEL Ship Builders! Are you looking for authentic, precision ship models? Send for richly illustrated fully descriptive catalogue in full color of famous ships of all kinds. Only 10c. Halesite Yacht Service Inc., Dept. C-35, Halesite, Long Island, N. Y.

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 20—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Mich.

SHIP Model Kits and Fittings . . . most complete stock in New England. Boucher, Fisher, Marine Model and Model Shipways fittings, blueprints and model yacht equipment at standard prices. Send 25c for new illustrated 1947 Catalog and price list. Dept. S., James Bliss & Co., Inc., 220 State St., Boston, Mass.

BUILD Model Ships, Railroads, Catalog 10c. Ideal, 21 West 18th Street, New York 11, N. Y.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

RAILWAY models, complete line. Combined HO and O gauge, catalogue, 35c. Walthers, 269 Erie, Milwaukee 2, Wisc.

SHIP model catalog 25c coin. Roy Hancock, 323 Douglas Ave., Portsmouth, Va.

MINIJET Engine Kit now $9.95 PP. USA Assemble real pulse-jet at home. Send MO today. No CODs. Minijet Motors Sales Company, Box 406, Pasadena, Calif.

FREE! Big Train Folder, packed with new Lionel cars, sets and accessories. Madison Hardware Co., 105-B East 23rd, New York 10.

POWER Models—steam and gasoline engines, steam traction engine, metals, tools. Catalog 35c. Charles Cole, Ventura, Calif.

STEAM boiler for model engines, withstands 300 lbs. pressure. Complete with pressure gauge and all fittings. Postpaid $22.50. Ross, B68 West Broadway, New York, N. Y.

STEAM engine, precision made to scale from brass and bronze. A practical working model that performs like its full size brother. Complete, fully assembled—ready for steam. Overall size 6" by 3"; weight 2¼ lb. $17.50 postpaid. Ross, B68 Broadway, New York, N. Y.

cents. Refunded with order. G. F. Harbin, San Dimas, Calif.

"SHIP Models of lasting Beauty", Copper Sails. Construction Sets, assembled Models. Folder Free. Trade Wind Models, P. O. Box 171-A, Lakewood, N. J.

STEAM engines—boilers—castings, Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

AUTOMATIC Switch Apparatus. Control each, few, all.—Signals, Toytrains, Photolights—$2.95. Am-Standard, 1208 N. 13th, Philadelphia 22.

MODEL engines—steam and gasoline. World's most fascinating hobby. Build them yourself in your own shop, using your own tools. Send ten cents for illustrated catalog listing world's largest selection of miniature engine castings and drawings. McAded Models, 1313 So. Talman Ave., Chicago 8, Ill.

87 A MOLDS AND MOLDING MATERIALS

RED Seal Rubber Company Develops New Compound! Genuine Natural Latex Base! Fully Guaranteed! Introductory Offer for $3.00—Complete Mold Making Course plus Quart of Red Seal Latex! Free Literature upon request. 116 Nassau St., New York 7, N. Y.

CREATE your own products "Snego Flexible Mold Master" teaches amazingly simple method for making rubber molds for plaster novelties. Complete with illustrations, $1.00. Snego, 1628 Blue Island Ave., Chicago 8, Ill.

71 HOME CRAFTSMEN

LEARN Sea-Shell Jewelry and Novelty manufacturing. No tools or experience needed. Learn-earn within a week! Complete, beautifully photographed home instruction course, shows you how to make 110 designs of pins, earrings, brooches, hair ornaments, necklaces, bracelets, plaques, ash trays, dolls, animals, miniatures, etc. Explains pearlizing, tinseling, golding, dyeing, luminous processes. Illustrates 65 species sea shells. Lists 200 raw materials with wholesale prices. Complete course $1 postpaid. Beginner's Kit $3 ($3.50 in Canada). House of Gifts—Box 4550-SA Coral Gables, Fla.

LEATHERCRAFT. Profitable hobby. Easily learned. Mail card for free booklet. Artcraft Leather of California, Dept. PS-11, 271 Twelfth Street, Oakland 7, Calif.

SHELL Jewelry Supplies — Wholesale only. McFarland Plastic Co., Sarasota, Fla.

SPECIAL Offer: 80 full size toy, novelty and lawn ornament patterns only $1.00. Lynds, Medway, Mass.

MAHOGANY—turning squares and blocks. Write for prices. M. W. Staylor, 307 S. Main St., Suffolk, Va.

BAIRD'S School Of Leather Carving. Correspondence course. Free—Interesting catalog of tools, leathers finishes, saddles. 1212 South Bonnie Brae, Los Angeles 6, Calif.

WOODCRAFTERS—New Woodcraft Patterns. Large Assortment. Illustrated Folder 10c. Joaness, P. O. Box 141, Omaha 7, Neb.

SPECIAL 77 Full Sized Patterns. Lawn Ornaments, Toys and Novelties. $1.00. Modern Woodcraft, Saginaw, Mich.

LEARN to make seashell jewelry; pins, earrings, hair ornaments, novelties. Book of Instructions and designs free with $2.00 or $5.00 kits. Postpaid. Herbert Diamond Co., Box 4619, Miami 31, Fla.

BAND and jig saw owners, let your machine and hobbie bring you profits, fun. Free Details. Nu-Art Designers, 34 Rosemont Rd., No. Weymouth, Mass.

GENUINE Leather scraps for leathercraft items, assorted colors, 6 pounds, $2.00. Send 10c for sample. International Cushion Co., 515-BA No. Halsted, Chicago 22, Ill.

"METALCRAFTERS! Send for catalog listing copper, brass, aluminum tools and supplies. Kit Kraft, 3203 W. Washington Blvd., Los Angeles 16, Calif."

SHELLCRAFT Jewelry Supplies. S. Werts, 1429-56th Avenue, Oakland 3, Calif.

START flocking—spray beautiful plush finish on everything. Supplies, equipment, instructions. Easy, inexpensive. Coast Industries, 1511 W. Manchester, Los Angeles 44.

LEATHER Craftsmen start tooling or carving immediately. Our designs on plastic require no tracing. Introductory offer $1.00. Sample 10c. Lampkin Artcrafts, Box 641-S, Culver City, Calif.

HUNDREDS Patterns: Plywood Novelty Furniture—Lawn Ornaments—Silhouettes—Weathervanes—Letters—Numerals—200 Craftsmen's Books & Booklets—Hundreds Decal Transfer Decorations. Other lines. Large Illustrated Catalog. Write Wo-Met Shop, Ashburn, Georgia.

Copyrighted material

EXPERIMENTERS! Interested in Electrical, Mechanical devices from war surplus? List Free. F. Siefke, Box 18, Station E. Buffalo, N. Y.

DRAWERS Sticking? Easily installed roller gives file cabinet ease to overload wooden drawers. 45c per set. Roll-eez, 4055 Moore St., Venice, Calif.

PLANS for toys, home and lawn furniture—jigsaw patterns. Illustrated folders 25c. Refundable. Summercraft Studio, 42 Vernon, Newton 58, Mass.

CELLULOID—New postwar, beautiful assortment. Mottles, opaques, onyx, pearls. Used by ring makers everywhere. One pound assortment—pieces approximately 30 sq. in. each. Price $1.00. Please add 10c for postage. Craft Service, 337 University Avenue, Rochester 7, N. Y.

1001 USES. All kinds of artificial leather suitable for artcraft, bookbinding, upholstering, shelving, etc. 10c in coin will bring you many samples and price lists. Maro Belt Company, 335 West 35 Street, New York 1, N. Y.

METALCRAFTERS! Send for catalog listing copper, brass, aluminum tools and supplies. Kit Kraft, 3203 W. Washington Blvd., Los Angeles 16, Calif.

18 BLUEPRINTS AND PLANS

"BLUEPRINT Reading Made Easy"—ready reference book for reading any type blueprint. 596 pages, 463 pictures. Formerly $8.95, now only $1.98. Popular Science, Dept. 117-C, 353 4th Ave., New York 10, N.Y.

DARLIN' Chair: A chair that was designed for babies just learning to walk. Safe! No post to injure face or eyes. Plans are full size. Price 25c. Vernon Supply Co., Box 76, Mt. Vernon, Illinois.

LOW Cost Blueprints of inexpensive houses. Hale, 2232 North Point, San Francisco 23.

BUILD Powerful Motors From Scrap. Photos, Instructions $1.00. Blakely's Electric Service, 375 Circuit Drive, Roseville, Calif.

23 BUILD IT YOURSELF

HOT Water Free—from Sunlight. System efficient any locality year 'round. Standard materials—easily built—low cost. Facts Free. Solar Water Co., Box 175, Dept. T, Coral Gables, Fla.

SPECIAL. Full size patterns make over 100 toys. $1.00. Complete plans for over 20 modern kitchen cabinets. $1.00. Free list. Masterprint, White Building, Buffalo 2, N. Y.

"BUILD Cabins"—book offers complete instructions and plans for building your own cabin, lodge, tourist home, or wayside stand. 251 Pages, 200 plans and pictures. Only $1.98. Popular Science, Dept. 117-C, 353 4th Ave., New York 10, N. Y.

BUILD concrete block machines, portable sawmills. Shop, farm, home machines. 70 plans. Catalog-Handbook Free. Nichols Equipment Co., Dept. 504, Purvis, Miss.

MODERNIZE any shop with our welded tool and bench supports. Lists free. Manufacturer, 5502 Hamlet Ave., Baltimore, Md.

"WOOD Shaper", build your own with our ½" ball bearing spindle assembly including fence, mounting plate and plans for Floor Model unit. $14.75 prepaid. Woodcraft Tool & Supply Co., Sylacauga, Ala.

"BUILD your Cedar Chest, Wardrobe, Quilt Chest from Tennessee Red Cedar. We furnish everything in our knockdown kit. Write us for anything in cedar. Craftsman Cedar Works, Fayetteville, Tenn., Box 217.

"CONCRETE Block Homes". 24 page booklet: drawings, instructions on how to build. $1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

DOGHOUSES of scientific design. Plans and material list for 4 sizes. $1.00 post paid. C. Miller, 1061 Rimpau, Los Angeles 6, Calif.

BUILD your own concrete Block machine. Easy, Inexpensive, New principle. Free details. Clyde Lee, Mountain View 1, Okla.

BUILD concrete block machine. 2 blocks per minute. Build concrete mixer. Easy, inexpensive. See illustrated ad, page 34. U-Build-It Service.

139 WATCH REPAIRING

WATCH and Clock Repairing—complete practical course in modern horology. 66 illustrated self-instruction lessons. Just out! Low price. Fascinating 100-page illustrated catalog Free! Write—Nelson Company, Dept. 3-01, Chicago 5.

WATCH and clock repairing increasing, complete home study course with drawings and pictures. Information free. Houston Chronometer and Watch Co., P.O. Box 1140B Houston 12, Texas.

WATCHES cleaned & adjusted—$2.95. Guaranteed. Simon, 1461 E. 91 St., Brooklyn 12, N. Y.

95 OLD GOLD, WATCHES, ETC.

CASH for Old, Broken Jewelry. Highest prices paid immediately. Mail gold teeth, watches, rings, silverware, diamonds, spectacles. Satisfaction guaranteed. Information free. Rose Smelting Co., 29-Y East Madison, Chicago.

GOLD $35.00 Ounce—Mail old gold teeth, diamonds, jewelry, watches—receive cash by return mail. Satisfaction guaranteed. Free information. Dr. Weisberg's Gold Refining Company, 1500-B Hennepin, Minneapolis, Minn.

NEW Guaranteed watches only $8.95. Detailed literature free. Schaffer Company, Springfield, N. J.

76 JEWELRY

CERAMIC Jewelry Supplies. Bar Pins, ear screws, for ceramic and woodworkers, also, glass and sea shell assemblers. Free catalog. Philadelphia Badge Co., 1007 Filbert St., Philadelphia, Pa. Dept. E-1.

JEWELRY Findings. Lowest Prices. George Sassen, 154 Nassau Street, New York 7.

GENUINE Diamonds at out-of-pawn low prices from unredeemed loans and cash buys. We offer beautiful gems at far less than original cost. Shipped free for Inspection. Appraisal. Write for Free list showing fine diamonds at amazing low prices. Lloyd J. Butler, President, Prudential Loan Association, 133 North Clark, Dept. K-107, Chicago 2.

STUN your Friends with Genuine, Sparkling, Brilliant-White Zircons. Cut, polished, mounted just like diamonds. Amazing diamond-like appearance. Top-quality. Hard for even experts to tell the difference. Beautiful settings 14K gold. Over 100 gorgeous latest-style rings to choose from. Attractive low prices. Send for Big Free Catalog. U. S. Zircon Syndicate, 139 N. Clark, Dept. ZH-107, Chicago 2.

OUT Of Pawn Genuine Diamonds direct to you at far below retail value. ¼ Ct. Diamond $135.00 Value, only $59.00. Write for Free Circular of other unredeemed diamond pledges $5.00 to $5000. Berman's Collateral Loan Bank, 636-38 W. Balto. St., Dept. PS-2, Balto., Md.

JEWELRY, Gem Cutting—Big Profits In Leisure Time. Huge instruction book and catalog 35c. Tools, equipment, materials. $1 for rough African Tiger Eye and Catalog $2.50 value guaranteed. Grieger's, Dept. JG, 1633 Walnut, Pasadena 4, Calif.

KEY-CHAINS. Silver Plated or Gold Plated. 25c including Federal Tax. Post Paid, worth 50c; Ideal for Christmas Gifts. Exceptional Value. Dominion Specialty House, Inc., 401 Broadway, New York 13.

MANUFACTURE costume jewelry at home for profit, hobby, therapy. Free wholesale supply catalogue. Instructions. Florida Supply House, Bradenton, Florida.

MAKE Money. Making Shell jewelry and novelties. Instruction book 75c. Kit $5.00. Catalogue free. Palm Shellcraft Co., 220 W. 9th St., Sarasota, Fla.

MAKE shell costume jewelry at home. Complete supplies Kits. Catalog. See Display. Tropical Shell-Art, 2 North Third Avenue, Mt. Vernon, N. Y.

PRECIOUS, semiprecious stones, plastic-metal findings, list 10c refundable with first order. Pickwick Findings, Box 780-C, Stamford, Conn.

132 TOBACCO & PIPES

PIPE Carving Kits $1.00. Seconds $5.00 pipes 65c. Literature Free. Carvapipe, 2829-A Dixie, Hamilton, Ohio.

CIGARS-Tobaccos—Write for particulars regarding better smokes for less money, mentioning your favorite brands. Pete Moberly, Box 998, Owensboro, Kentucky.

CIGARETTES—$1.50 per carton of 200, postpaid. Save money on Camel, Chesterfield, Luckies, Philip Morris, Old Gold, Pall Mall, Tareyton, Kool. Minimum 3 cartons; no order too large. We pay postage, insure, and always ship fresh cigarettes immediately. Act now! Mail check or money order, or request C.O.D. Don't delay! Send your order today. John Robert Sales Co., Box 1, Dept. AE, Clayton 5, Missouri.

86 MISCELLANEOUS

FIREWORKS: Don't be disappointed. Get Famous Banner Fireworks with all the newest and startling effects. Giant Cannon Salutes that rock you like a crash of thunder. Whistling Devils with weird unearthly noises. Skyrockets that burst in majestic colorful display. Gasp in amazement as you watch the "Battle In The Clouds". Genuine Chinese Firecrackers. Over 200 pieces including Sparklers for the little tots. Retail value over $10.00 for Only $4.95. Rush order today. Any quantity. Send money order, bank draft or currency, no C.O.D.'s. Banner Fireworks Mfg. Co. Inc., Dept. 113, 446 Capistrano, Toledo 12, Ohio.

GOOD "Used" self-instruction educational books on all subjects bought, sold, rented, exchanged. Satisfaction guaranteed. Complete information and 100-page illustrated bargain catalog Free! Write—Nelson Company, Chicago 5.

HULL Automobile Compass, for accurate road direction brand new. $2.50. Prisms for 6x30 or 8x30 Binoculars, brand new, $1.50 each. Offset prisms to be attached to 7x50 B. & L. Binoculars, gives double the field of the ordinary 7x50 Binocular. Cost $98.00, special $25.00. Green Sunshades for Binoculars size 6x30 and 7x50 snap on type, value $7.50, special $1.25 per pair. Forward money order. No C.O.D. shipments. Send coin $1.25 for Third Annual Edition of Gun Digest together with our complete catalog of new and used guns, ammunition, rifles, binoculars and powder flasks. Our separate catalog 25c. Public Sport Shops, 13 S. 16th St., Philadelphia, Penna.

CREATIVE Psychology. Transformation through the renewing of the mind. "All things are possible to him that believes." Send for Free booklet. Menticulture, Box 823D, Chicago 90.

MEN! Large size shoes, Large Size Sox! We specialize in large sizes 11½ to 16, widths AA-EEE. Oxfords, Hitops, Work Shoes. Guaranteed extra quality. Free catalog. Kingsize, 425, Brookton, Mass.

GET Lots Of Mail: Name Listed Three Directories 25c. Harvey Teeple, Decatur, Ind.

INCOME Tax bookkeeping for average farm simplified. Originated from actual farm problems. $2.50. The Farm Bank Co., Colby, Kansas.

PLASTIK—707—Stops Polishing. Liquid Plastic seals polished Brass, Copper, Silver, Chrome, against tarnish, corrosion, rust. Perfectly transparent, durable. Enhances beauty fine woods. Brilliant, high gloss, enriches color, grain. Eliminates polishing, waxing. Lustrous protection, waterproof, stainproof, for documents, maps, charts, books, photos, pinups, canvas articles. Easily applied without brush marks. Unaffected by alcohol, hot water, sun, dilute acids, alkalis. Glass jars, 4 oz. $1.50, 8 oz. $2.25, 16 oz. $3.00, prepaid, including genuine camels hair brush. United Technical Laboratories, Morristown 2, N. J.

A THOUSAND Laughs. Unique Jackass Cigarette Dispenser. Holds 10 Cigarettes. Simply press donkey's head down, tail raises—presto—out slips cigarette. Satisfaction guaranteed. Ideal for Christmas gifts. Sent postpaid for $1.00 with order or $1.15 C.O.D. Sanimo Industries, Dept. PS-13, Spencer, Indiana.

PANNING Gold. Free instruction Booklet. Old Prospector, B-61, Dutch Flat, Calif.

ART Photos! Sample 50c, 3 for $1.00. Post Office Box 2011, Phoenix, Arizona.

LOCATE Any article made $1.00. Business Service, 1101A Kings Highway, Shreveport, Louisiana.

FREE literature how to locate buried treasure and minerals. Fisher Laboratory, Inc., Palo Alto, Calif.

RECEIVE Big Mails, samples, catalogs. Two-year listing, $1.00, 9-month, 50c, 3-month, 25c. Stanford, 6220-M16th, Philadelphia 4.

TOPS! Lifetime Ballpoint Fountain Pen $1.00—Free Literature. Novelty Enterprises, Dept. 24, Box 2341 Terminal Annex, Los Angeles 54, Calif.

PUTTY applied this way becomes crumbleproof, jarproof, hardens stonelike, stays on lifetime. Easy, extremely practical. No gadgets. Instructions, $1. Aldo, Brooklyn 14, N. Y.

LOVELY Pin-Up Girls. Real, Actual Photographs. 10 for $1.00. Sixty different $5.00. M. Wilkins, 417 Hill, London, Canada.

FOOT Sufferers—Get quick relief with Kindschi Foot Balancers. Thousands of satisfied customers. Free Literature tells How. Kindschi Foot Appliances, GI, 321 W. Jefferson, Dallas.

TEN sizzational glamour photos. $1. Pilgrim, Box 194X, Springfield, Mass.

PROTECT Your Good Hat. As Your Raincoat Protects Your Clothing. Get A New Plastic Hat Cover! Only $1 postpaid. Send Hat Size. Satisfaction guaranteed. Bestyet Distributors, 545-HD Fifth Avenue, New York 17.

Copyrighted material

"FOR Farm and Home use, a compact kit of industrial adhesives is offered for $1.98 prepaid." Plastic Rubber Products Co., 127 Hudson Street, Hackensack 7, N. J."

"FOUNTAIN Toothbrush with dentifrice—Postpaid or C.O.D.—$1.00 Port-O-Fount, Box 342, Watertown, Wisc.

RECEIVE mails, literature, magazines. Your name in numerous mailing lists 10c. Zeke Greenwood, 273 Broadway, N. Y.

FREE Details—Cash in your spare time. Charles, 12 EC, Norwood, Ohio.

PINE Cones 3 to 4½ ins. 100 $2.00. All kinds. Write for prices, samples, postpaid $2.00. Maryland Nursery, Hyattsville, Md.

"ANNE Whittle Chocolates, Fresh Daily, None Finer, $1.25 pound postpaid, money back if not a real treat. Moran's, Middleport, N. Y."

138 WANTED MISCELLANEOUS

MERCURY—Highest prices. Free Containers. Write Mercury Terminal, Norwood, Mass.

ANYTHING bought-sold-traded. Send for free list opportunities. Buyers Bulletin, P. O. Box 415, Evansville, Indiana.

57 FOR THE HOME

"REPLACEMENTS"—Stoves, Furnaces, Grates, Firepots, Linings. Magic, Royal Oak 128, Michigan.

"AIRGUIDE" Indoor-Outdoor Thermometer. Handsome scientific instrument shows outside temperature indoors. Ideal gift. Circular free. $6.00 postpaid. Trade Winds, 727 30th Street, Rock Island, Ill.

MOVIE Cartoon Originals, Painted on Plastic, 10x12½, for rumpus, children's room. $1. Stanley, 1434 N. Western, Hollywood 27, Calif.

101 PERSONAL

PSORIASIS Sufferers: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for Free important information. You needn't invest one cent! Pixacol Company, Dept. S, Box 3583, Cleveland, Ohio.

CIGARETTES—Popular Brands $1.39 a carton, delivered. Minimum order five cartons. Send check or money order: Pem Co., 5041 Pembridge Avenue, Balitmore 15, Md.

TRUTH About Mind Power! 20 Years research. Startling, concise, authentic. Amazing results! Complete $1.00. Saunders, 435 North Peninsula, Daytona Beach, Fla.

PERSONAL Problems, everyone has some sort of problem. Don't worry any longer. Let a consultant help you. Individual confidential service. Answer returned to you in plain envelope. Send $1.00 with full particulars. Michaud, Box 546, Salem, Mass.

ALL About Women! Are you interested in women? Have you some unfulfilled desire wherein a woman is concerned? Would you like to know how some men get away with it? This book not intended for women to read. Tells too much. Send $1.00. Book mailed in plain wrapper. Confidential. Pack-Way Service, P. O. Box 7211, Fort Worth 11, Texas.

RUPTURED? Positive comfort, no understraps, no steel, no elastic. Write Smith Manufacturing Co., Preston, Ontario.

HAIR Falling? Dandruff? Write Trichologist, 139 Lewis Street, Phillipsburg, N. J.

HOW You Can Find Out! Information discreetly developed, any matter, person, problem anywhere. Personal-business assignments, representations, undertaken. Nationwide. Officially Licensed and Bonded Service established 1922. Reasonable. All inquiries confidential. William Herman, 170 Broadway, N. Y.

ALCOHOLISM is a Disease amenable to our treatment. If this evil threatens your home, job or business. Do Something Now! Write for Free Folder. Established 50 Years. The Murray Institute, 620 S. Tenth St., Minneapolis.

TEN Ranch postcards, you address return we remail $1.00. Box 712, Corsicana, Texas.

UNUSUAL, Amusing Novelties, samples 10c. Modern Products, Box 2, New York 2.

MATRIMONIAL—Sweetheart Magazine, 50c, 6 mos. $1.00, Yr. $2.00. Barwood, 2037-E 42nd, Astoria, N. Y.

INFORMATION for single people by Human Relations Consultant. University Graduate. Dr. B. Long, Box 375, Los Angeles 53, Calif.

PILES? Worry Not. Guaranteed, medicineless. Permanent relief. Write. J. Ragno, Berwick 1, Penna.

SWISS Wonder Salve—for Boils, Cuts, Carbuncles, Felons and Infections. Prevents blood-poisoning. Draws out inflammation and foreign matter. Amazingly effective. $.25 per box, five for $1.00. Wolff Laboratories, 19218 Dorothy, Cleveland 16, Ohio.

THICKER, lovelier hair for men and women. All about latest secrets, discoveries free. Write immediately. Bruns, 3307-E Fremont, Madison 4, Wisc.

EMBOSSING ink kit, $1.00 Postpaid. Feole, Box 708, Huntington Park, Calif.

WINE with a wallop. Inexpensive. Most sublime ever tasted. Formula $1.00. Aydel Co., Box 1, Pasadena 3, California.

"DANIEL'S 2300 Days." 15c. Bulletin. Box 87, Cathedral Station, New York 25.

"DISSATISFIED? Don't Give Up! Study the Bestyet Success Course! Based on Both Metaphysical and Practical Principles! Sample Lesson $1. Satisfaction Guaranteed. Details Free. Bestyet Distributors, Room 907, 545 Fifth Avenue, New York 17, N. Y."

LETTERS Instructions, treatments, any problem. Metaphysical Practioner and teacher. $10.00. Iona A. Wachel, Ps.D.; D.D., Delaware, Iowa.

"NIAGARA FALLS or Buffalo, N. Y. mail forwarding and representative services. Confidential: Mail 25c each or unlimited $1.00 weekly. Blain's Services, 29B Coe Place, Buffalo 8, N. Y.

BUY Vitamins Direct. Amazing Savings. Money Back Guarantee. Our 9th year! Postcard, Matoska Products, White Bear Lake, Minn.

1 ADVICE

EVERY Family can have Optimum Health. Name each Ailment. Send $2.00 total cost. Health Club of America, 2219 N. 54th, Seattle 3, Wash.

2 ADVERTISING

ADVERTISERS: Mail order ad covering United States—2,200,000 circulation —$28.00 inch. Classified ad, 24 words, 20 metropolitan Sunday newspapers—$25.00. Magazine, newspaper, mailing-list rate-book, adwriting assistance—free. Chicago Advertising Agency, 20-PS West Jackson, Chicago 4.

ADVERTISE: 24 words, 40 Newspapers $3.50. Lists Free. Advertising Bureau, 229-P Dixson Blvd., Uniontown, Penna.

24 WORDS in 64 Weeklies $4.96. J. Darnell, 730 Hays, Jackson, Tenn.

INCH Display Advertisement Mail-order World, year $24. Wood's Popular Services, Atlantic City, New Jersey.

ADVERTISING folders, Catalog — designed and written by industrial advertising executive—25 years experience. Send $5.00 for analysis and report on your present product literature. Satisfaction guaranteed or money refunded. L. S. Van Denburgh, Box 201, Newark 1, N. J.

66 HANDWRITING ANALYSIS

ATTENTION! Handwriting analyzed. State age. Enclose $1.00. Otty Kling, 2240 Selma Ave., Youngstown 4, Ohio.

45 DRAFTING INSTRUMENTS

SAVE on drafting materials. Free catalog. Draftsmen's Supply Co., 32 North Wells, Chicago 6.

129 TATTOOING SUPPLIES

TATTOOING Outfits, Supplies, Illustrated List Free. Zeis, 728 Lesley, Rockford, Ill.

119 SCIENTIFIC EQUIPMENT

MICROSCOPES all makes accessories, microfoto lamps, immediate delivery. Gamma Scientific Company, 95 Madison Ave., New York 16, N. Y.

120 SCIENTIFIC SUPPLIES

LABORATORY Supplies, Chemicals, Glassware, Etc. Low prices. Large Catalogue 15c. Microscopic Stain Catalogue 20c. Both for 25c. National Scientific Company, Established 1908. 2204 W. North Ave., Chicago 47, Ill.

27A CANDY MAKING

MEN—Women—"Everybody Likes Candy". Learn to manufacture professionally at home. (Our 37th Year). Ragsdale Candies, East Orange, N. J.

142 WOODS

CHRISTMAS Cards of real wood. Write, Cards of Wood, Manlius, N. Y.

TEXAS Ebony, America's Most Beautiful Lathe Turning Wood. Large piece, $1 Prepaid. Sample, Dime. Information on Southern Woods, Stamp. Starcraft 2, Edinburg, Texas.

73 HUNTING

GUN Scope, Army Surplus M-41. ⅞"x8⅞", weight 12 ounces, Eastman, $14.95. Ed Bartholomew, 8242 Travelair, Houston, Texas.

81 A MAGNETS

ALNICO Magnet—Lifts Ten Pounds! $1.00. Catalog 3c. Ronald Eyrich, Box 849, Milwaukee 1.

TWELVE Alnicov Magnets, 100 experiments. $3.00. Experiments, 25c. Disc Magnet, $1.00. Eljay, Box 891, Newark 1, N. J.

134 TREASURE FINDERS

M-SCOPE Metal Locator fully guaranteed and unsurpassed in efficiency. New featherweight models. Time payment plan. Free literature. Fisher Research Laboratory, Inc., Palo Alto, Calif.

METAL Detectors. The Very Latest Circuit. Free Literature. Hedden Metal Detectors. 538 North Homewood Avenue, Pittsburgh 8, Penna.

SEEK Buried Treasure. Methods, mysteries, devices explained. Circulars free. Century Press. Box 151-D, Glen Ellyn, Ill.

TREASURE Hunters! Radically new Goldak locators. New featherweight Model 101 weighs only 11 pounds! Revolutionizes location of Gold, Silver and Minerals. Money-back guaranteed superior any other. Write The Goldak Co., 1544 W. Glenoaks, Glendale 1, Calif.

42 DETECTIVES

DETECTIVE Training. Phillips Secret Service, 1917C, N. Kenneth, Chicago 39, Ill.

DETECTIVES—Work home—Travel. Experience unnecessary. Write Wagoner P-125 West 86th, N. Y., N. Y.

BE A Detective—Send for price list of self-instructional courses at reduced prices. Perkins Publications, 300-C Brandies Theatre Building, Omaha, Nebr.

89 MONUMENTS

BUY a monument or sell them for us. Agents wanted everywhere. Big catalog Free. Marble-Granite Factory, Oneco 50, Florida.

93 NAME LISTS

LATE Mailing Lists! Teachers, Births, Automobile Owners, Etc., Business Service, 1101A Kings Highway, Shreveport, La.

MILLION Names. State your needs. Q Service, 422 S. Dearborn, Chicago 5, Ill.

84 MILITARY INSIGNIA

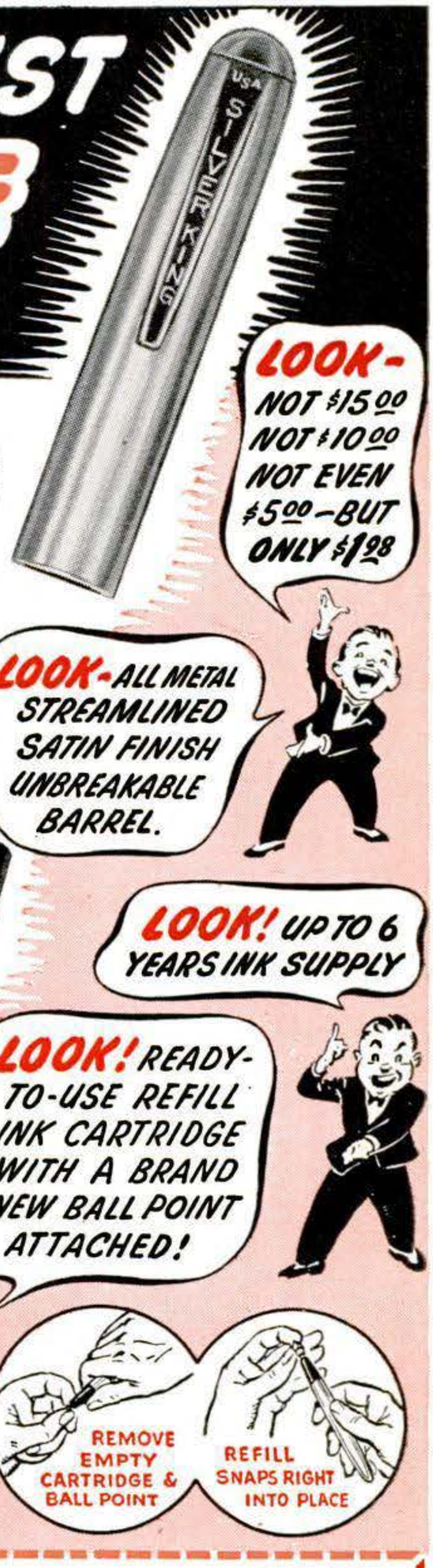
50 DIFFERENT army patches postpaid for only $1.00. (factory rejects) Catalog free with order. Insignia Mart, 703 Broadway, N. Y.

FREE—3 Military Emblems, with Catalog 10c. Hobbyguild, X35 West 32, N. Y.

Copyrighted material

The Most Amazing Offer ever made to Readers of **POPULAR SCIENCE**

NOW...THE GREATEST BALL PEN VALUE OF ALL TIME!



. . . new, improved Ball Pen that sold by thousands for $6.95 a few months ago PLUS ready-to-use refill ink cartridge, with brand new ball point attached, now offered at startling low price of only $1.98.

Never before has there ever been a ball pen offer like this! Martin King, the fountain pen king, now tops all other offers . . . by offering this sensational new value . . . a regular $6.95 ball pen PLUS a refill ink cartridge with brand new ball point attached . . . **all for only $1.98.** Note the many features shown at right . . . a beautiful all-metal pen . . . streamlined unbreakable satin finish barrel . . . 6 year supply of ink . . . a ready-to-use refill ink cartridge with brand new ball point attached. When your pen finally runs dry . . . presto! Just a simple twist of the wrist and out comes the empty ink cartridge, worn point and all and . . . presto! In goes the brand new ink cartridge with brand new ball point built together for continuous pleasure and dependability. All these features and the extra ink cartridge with new ball point are now yours for only $1.98.

ANOTHER FIRST BY MARTIN KING

(The Fountain Pen King) who has produced and sold more fountain pens direct to the public than all other pen manufacturers combined!

Martin King is the Henry Ford of the fountain pen industry. For 26 years he has been a pioneer in designing quality fountain pens . . . and bringing them down to the price that the average man can afford. In this sensational new offer, he has introduced his latest and greatest value. At his present costs, this pen with refill ink cartridge and brand new ball point would have to sell at $10.00 or more to show a profit! But he has staked everything on the belief that, at this low $1.98 price, volume sales will bring down his cost—and that this $1.98 value will be the largest selling unit of its kind at any price! Readers of POPULAR SCIENCE get first call on this great value. For this advertisement is one of the first public announcements in America! And here is Martin King's challenge offer . . . to prove to you that you should mail the coupon below and be among the first to cash in on this great value:

SEND NO MONEY Just Mail Coupon!

Satisfaction Guaranteed or Your Money Refunded PLUS ONE DOLLAR FOR YOUR TIME AND TROUBLE!

ONLY $1.98

Yes, Martin King makes this challanging offer. Don't send a penny. Just mail coupon at right. Pay postman only $1.98 plus C.O.D. postage when package arrives. Then try this pen. Compare it for writing quality in day-by-day use. Then if you're not 100% delighted with the "buy" you've made . . . just return it. Martin King will not only refund your purchase price in full. . . . HE WILL PAY YOU ONE DOLLAR EXTRA FOR YOUR TIME AND TROUBLE. You'll agree that Martin King must have an outstanding value when he makes such a daring offer. So get yours without delay. Mail coupon at right!

THE PENMAN Dept. 48-P, 179 N. Michigan Ave., Chicago 1, Ill.

THE PENMAN **MAIL THIS TODAY**

Dept. 48-P, 179 N. Michigan Ave., Chicago 1, Ill.

Send me regular $6.95 Ball Pen PLUS refill cartridge, with brand new ball point attached. When package arrives, I will pay postman $1.98 plus C.O.D. postage. If I am not 100% satisfied, I reserve the right to return it for refund of my $1.98. And in addition, you are to pay me one dollar for my time and trouble in testing it.

Name.....
(print plainly)

Street.....

City.....Zone.....State.....

☐ Put X Here for 2 Pens for $3.96

Copyrighted material

Your enjoyment climbs to new altitudes through radio and television achievements of RCA Laboratories.

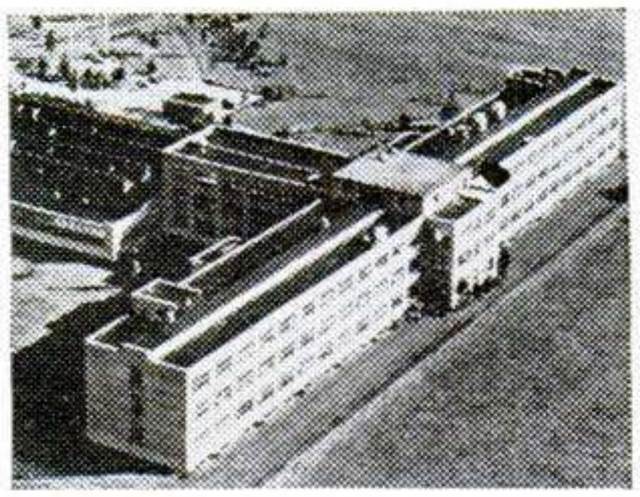
RCA LABORATORIES—your "magic carpet" to new wonders of radio and television

More and more people will go sightseeing by television as the number of stations and home receivers increases. Eventually, television networks will serve homes from coast to coast . . . bringing you the news as it happens . . . sports events . . . drama . . . vaudeville.

Many of the scientific advances which have made possible these extended services of radio-electronics, in sound and sight, originated in research conducted by RCA Laboratories.

Recent RCA "firsts" include: ultra-sensitive television cameras that give startling clarity to all-electronic television . . . tiny tubes for compact, lightweight portable radios . . . "picture tube" screens for brilliant television reception.

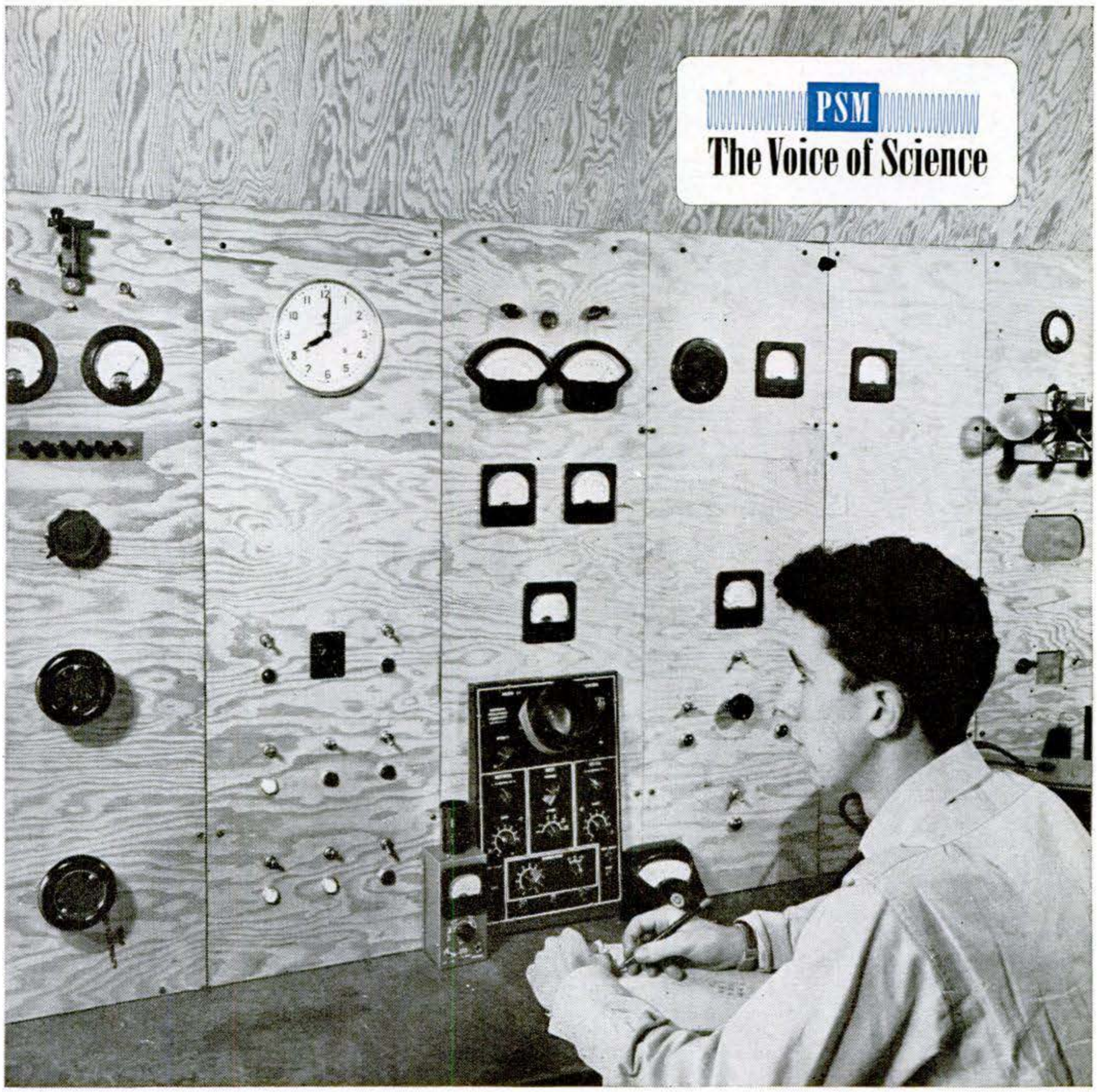
In other fields of radio-electronics, RCA has pioneered major achievements—including development of the electron microscope. Research by RCA Laboratories goes into every product bearing the name RCA or RCA Victor.



RCA Laboratories at Princeton, N.J., one of the world's centers of radio and electronic research. • When in New York City, see the radio-electronic wonders on display at RCA Exhibition Hall, 36 West 49th Street. Free admission. *Radio Corporation of America, Radio City, New York 20.*

RADIO CORPORATION of AMERICA

Copyrighted material



Atomics for Schoolboys

MEET Richard Sinnott, age 18. He is a student at the El Cerrito High School in California. He is sitting at the unglamorous plywood control board of one of the most exciting machines ever devised by man.

It is a baby cyclotron, put together by four El Cerrito students under the inspired leadership of their physics instructor, Ben Siegel (see p. 102). To dare such a project —a little like building a blast furnace in the back yard—called for considerable courage. To complete it, within limited space and funds, called for a lot of plain hard work.

Oak Ridge or Caltech hardly need fear the competition of this home-made atom-smacker. But, small as it is, the El Cerrito cyclotron has made a big contribution. It has brought nuclear physics—once the private preserve of heavy thinking and heavy equipment—closer to home.

To these lucky students, as they put the pieces together, theory became practice. And as they wound the wire to make the magnet and saw the machine take shape, they got an awareness and a sense of personal participation in the biggest problem in the world.

Whatever its actual output of radioactive materials, its production as a tool of understanding is important.

Perry Githerens

Copyrighted material

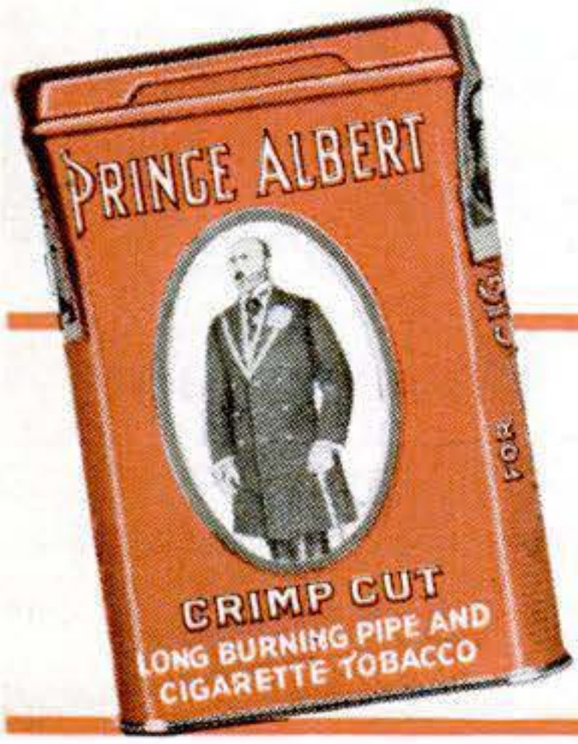
You score high when you've got P.A.*

P.A.* means Pipe Appeal

It's that distinctly masculine look of the pipe-smoking man that appeals to *her* — and it's rich-tasting, cool-smoking Prince Albert that appeals to *him* in his pipe.

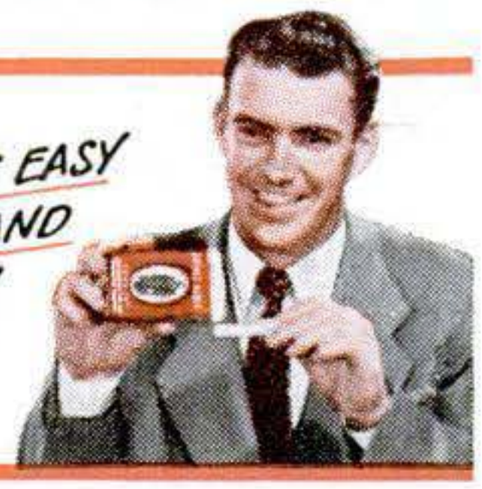
P.A. means Prince Albert

Rich tasting . . . mild and easy on the tongue — that's Prince Albert—the National Joy Smoke! P.A.'s choice tobacco is specially treated to insure against tongue bite. More pipes smoke P.A. than any other tobacco!



THE NATIONAL JOY SMOKE

ROLL YOUR OWN? IT'S EASY WITH CRIMP CUT P.A. AND IT'S GREAT SMOKING!



R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

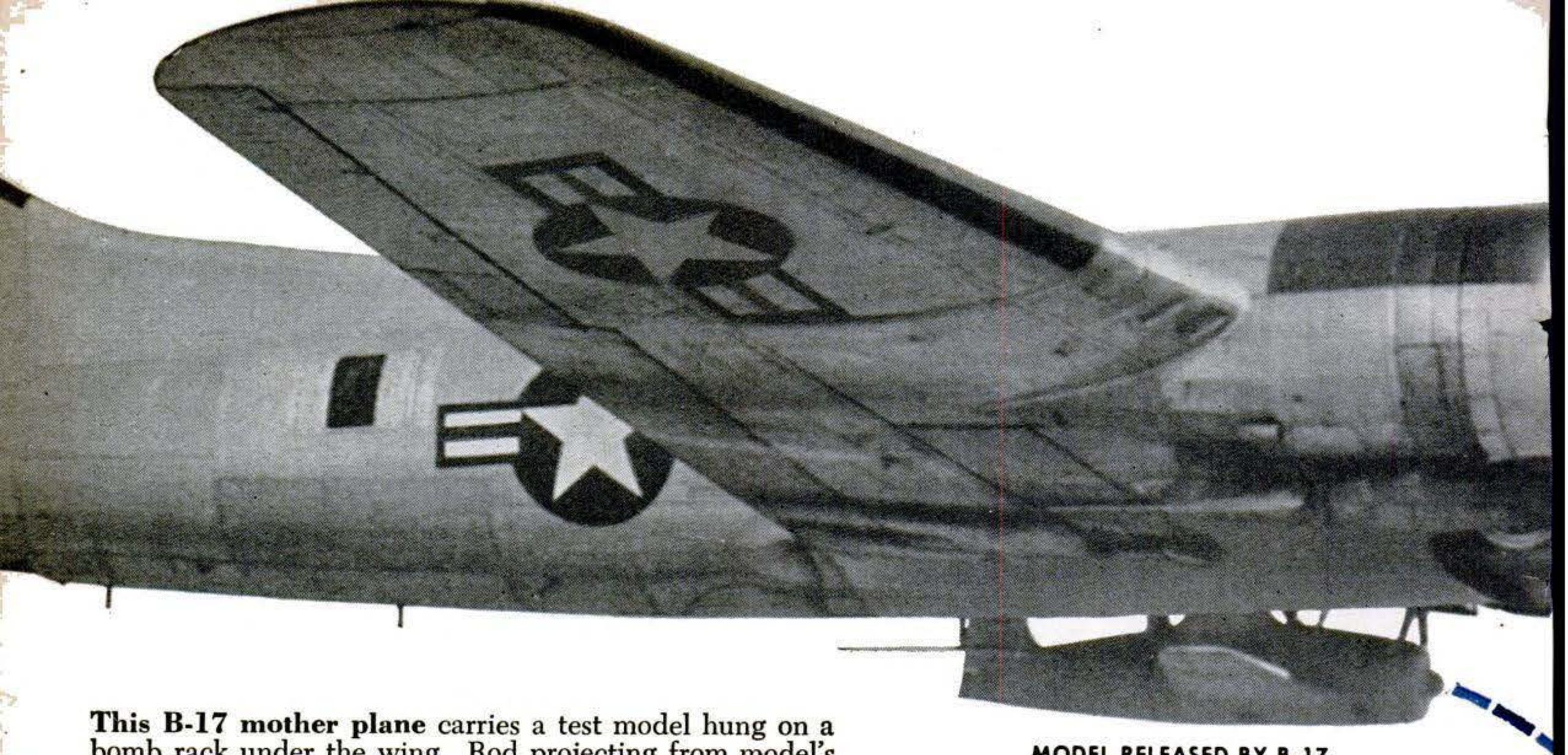
Copyrighted material

NOVEMBER 1947
Popular Science
Monthly

Tough, Dangerous, and Dirty ...

Working high up in a regenerating unit is but one of the many nasty and hazardous jobs involved in the annual cleaning of a cat-cracker. These catalytic oil-processing units, operating 24 hours a day at temperatures around 1,000° F, take a terrific beating from erosion and corrosion. The "turnaround"—the cleaning process—involves shutting down the plant. A crew of 360 men did the job on this M. W. Kellogg unit at Gulf's Philadelphia refinery without an accident.

Copyrighted material



This B-17 mother plane carries a test model hung on a bomb rack under the wing. Rod projecting from model's tail is the antenna for the telemetering equipment.

MODEL RELEASED BY B-17 IN LEVEL FLIGHT

Robot Planes Dive Into Speed's Mysteries

Without pilots or engines, the Navy's 600-mile-an-hour midgets report from the edge of the sonic barrier.

By George H. Waltz, Jr.

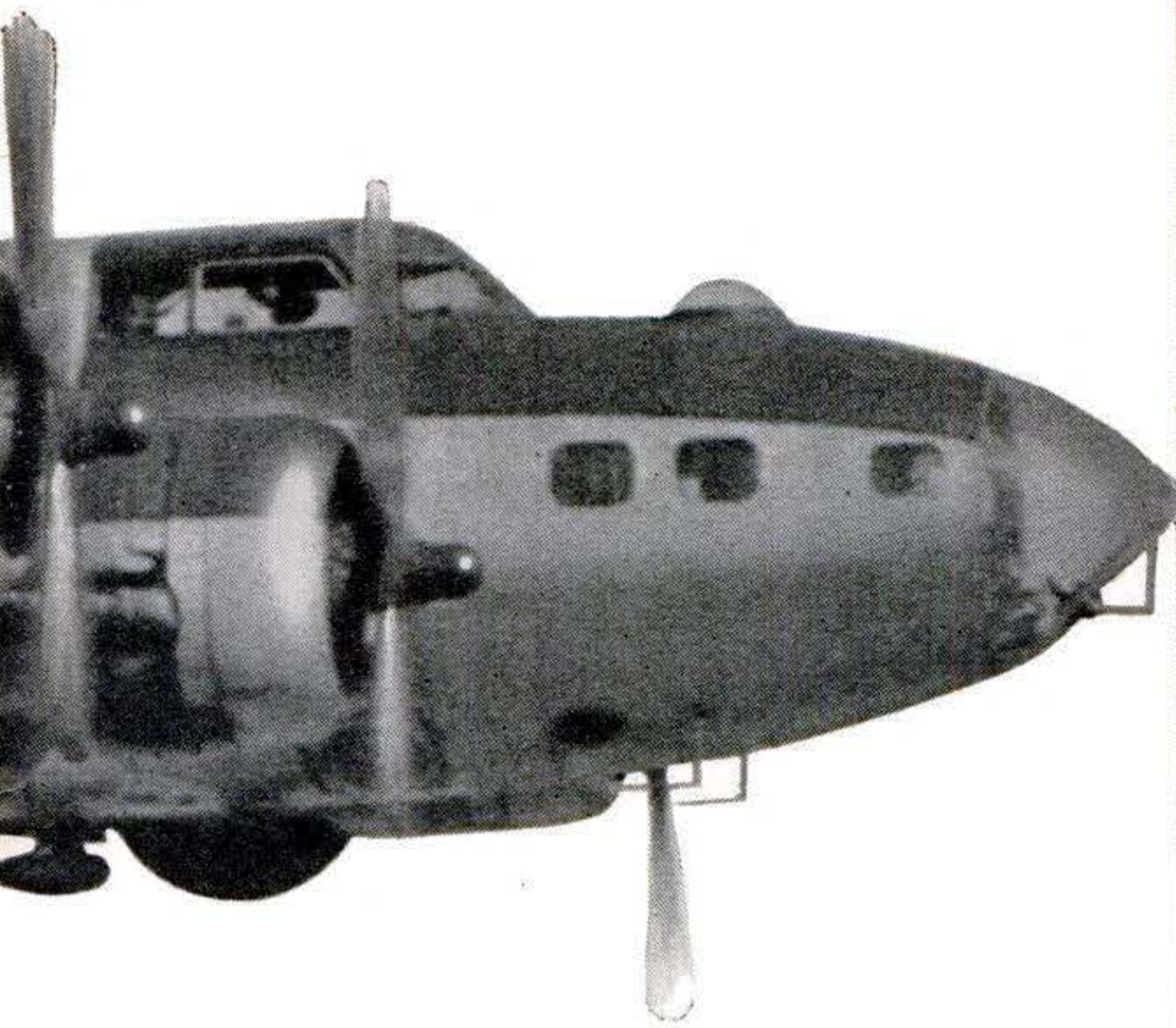
A B-17 drones steadily across the sky. Suddenly, from under its wing, a tiny plane drops into a steep dive. No propeller spins, no jet roars, but it screams down at 600 m.p.h. No pilot sits at the controls, but the midget pulls out of the dive and swings upward in a long curve. For a second it seems to hang in the air. The nose blows off and hurtles down. Then a great plume of parachute appears over the plane and it drifts slowly to the water below.

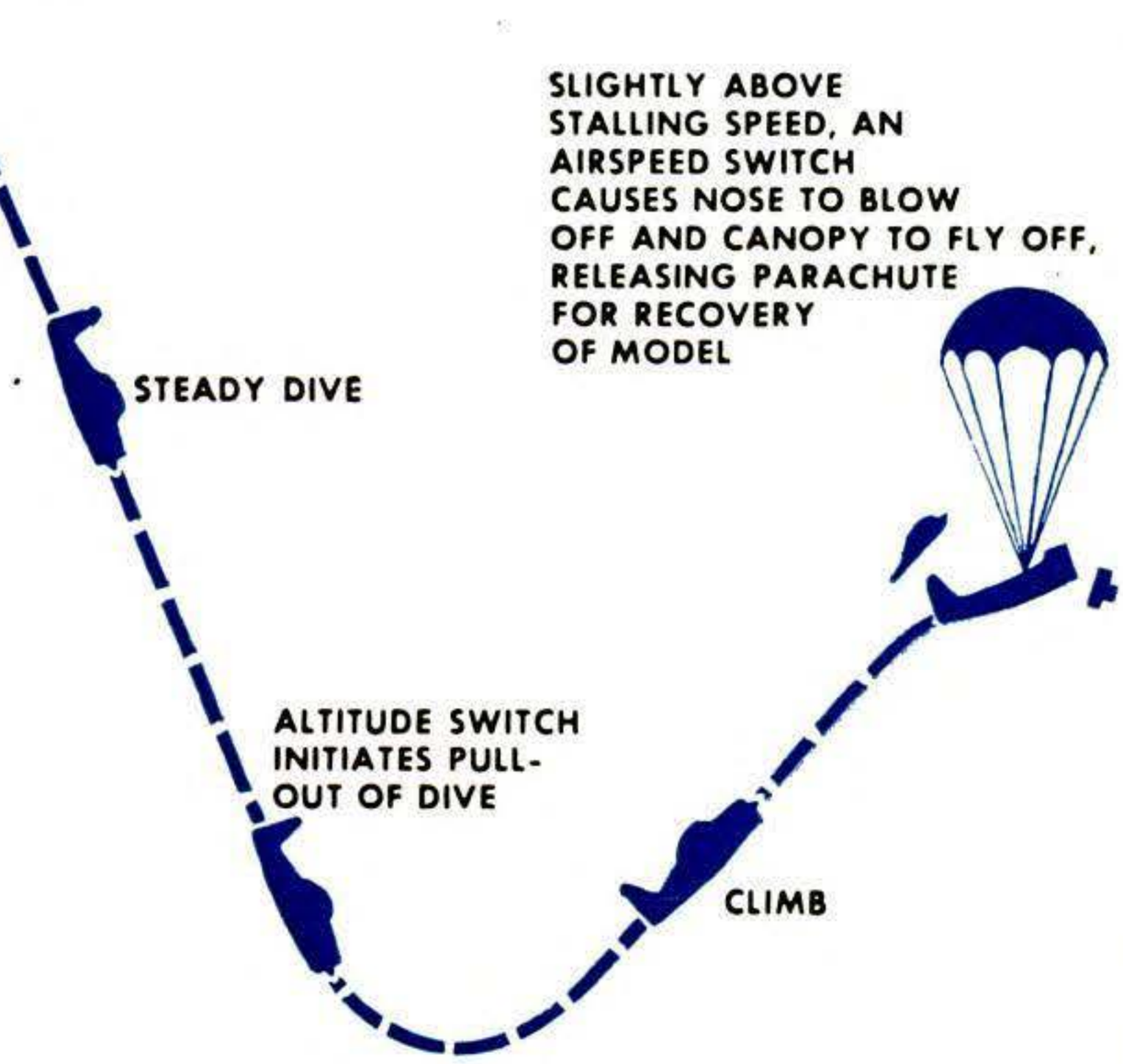
That's the Navy's latest approach to the problem of designing transonic and supersonic aircraft. The diving midget is an exact scale model of a proposed superspeed plane. Dropped at the Navy's target range near Wallops Island, off Chincoteague, Va., it is put through its paces by preset controls while a radio telemeter reports what happens. Experts of the Naval Air Experimental Station at Philadelphia believe that this model-dropping gives actual flight data unobtainable from wind tunnel tests. And it does it without risking the life of a pilot or the loss of a full-size plane.

The 1,500-lb. models are built of wood to stand a pull-out force of 30 Gs (30 times the pull of gravity). Aerodynamically they are the same as a full-size plane of the design under test, but they are only four-tenths as large and a 450-lb. lead nacelle replaces the engine. Right behind the nose is the six-channel radio telemetering system. Behind that again, about where the cockpit would be in a regular plane, is the automatic gyro flight-control gear.

The model is hung in a modified bomb rack under the left wing of the mother plane, to the right of the inboard engine. About 10 minutes before drop time the gyro control and telemetering systems are turned on. The pilot puts the mother plane through simple maneuvers to make sure that the model's control surfaces are reacting properly and the telemeter is working. The model's ailerons, rudder and elevators should move in opposition to those of the mother plane, since the control gyros try to keep the model's wings level and its nose on a straight course. These movements show up in the mother plane's telemeter receiver.

Copyrighted material

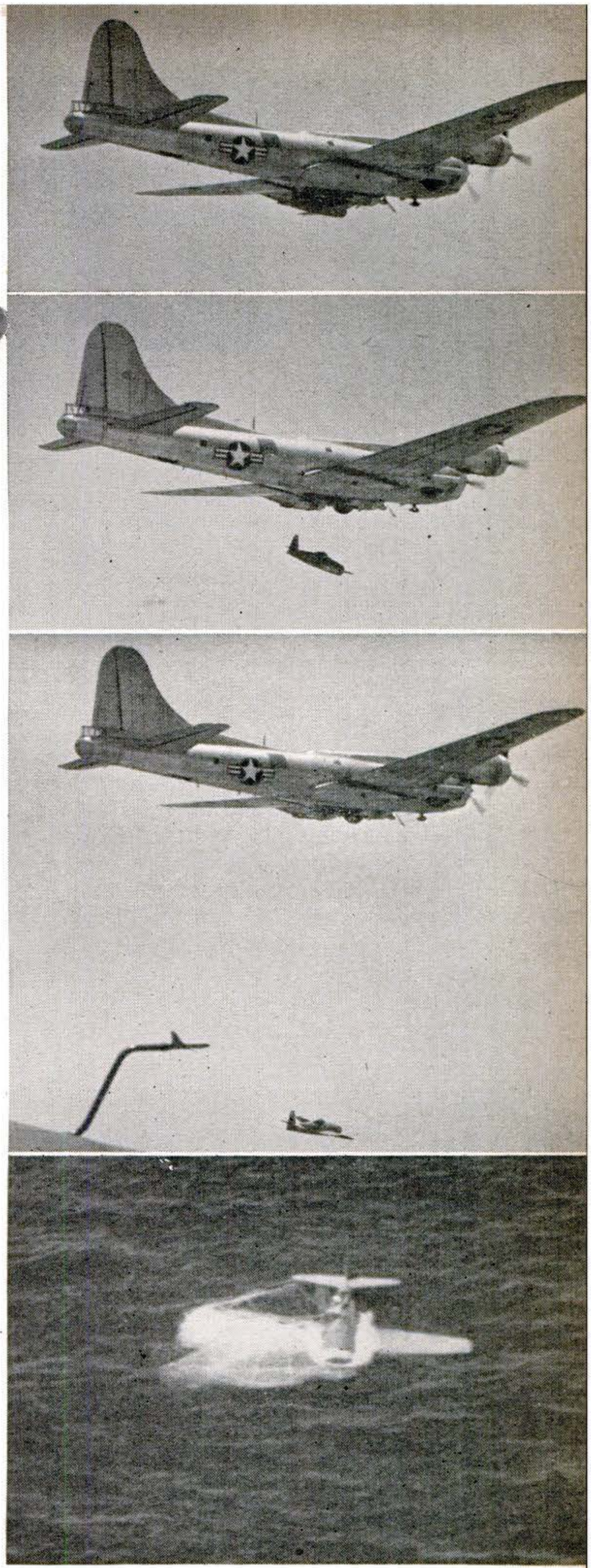




Just before the drop, the pilot feathers the propeller on the mother plane's No. 2 engine to eliminate any backwash or turbulence that might interfere with the release. Then, at "D" time, with the mother plane flying straight and level, the pilot pushes the bomb release and the model drops.

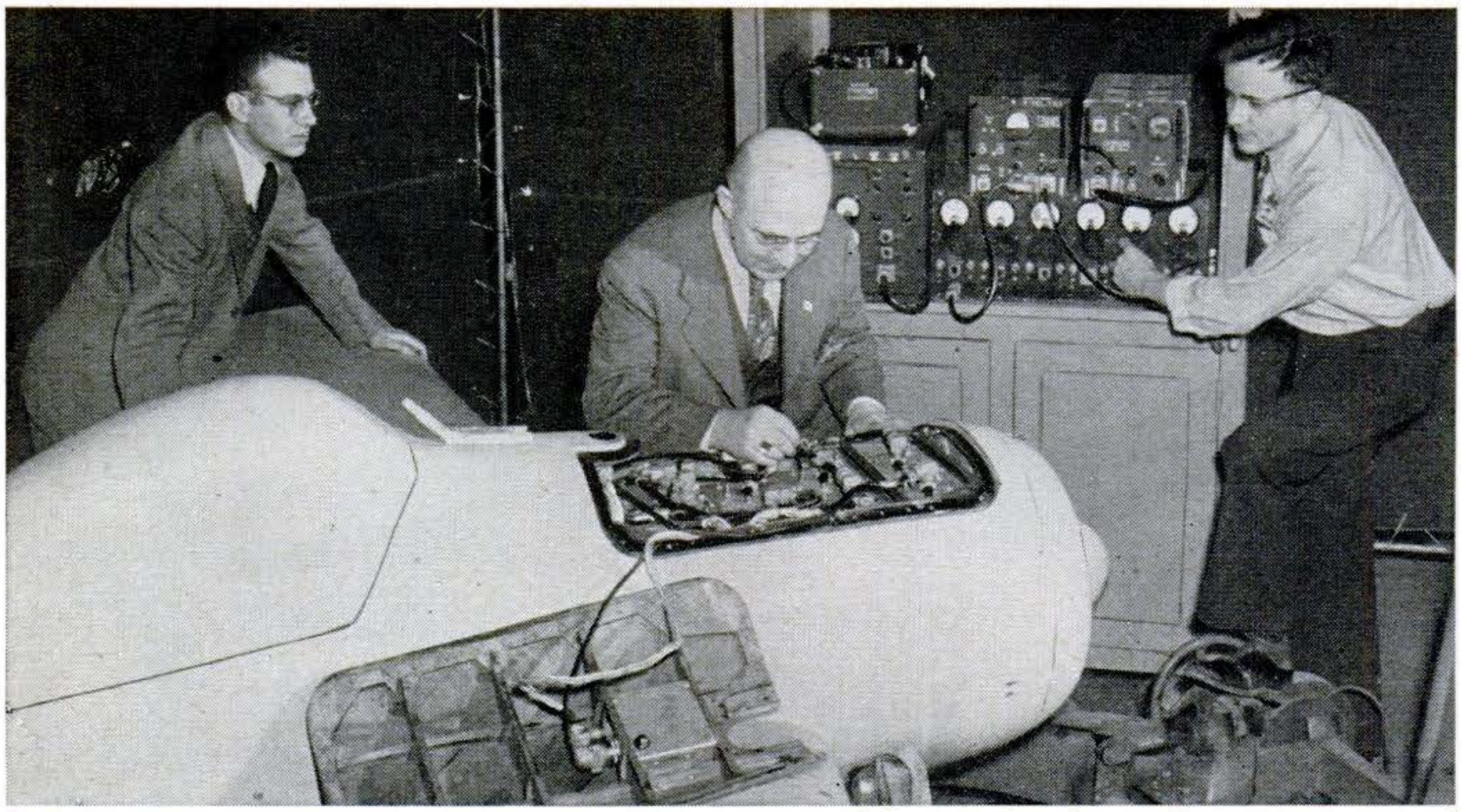
Immediately four sets of ground observers go into action. Two crews man identical telemetering receiving stations mounted on trucks, checking each other and ready if one receiver should fail. A third crew tracks the model by radar to plot its flight path. The fourth checks the path visually with a theodolite. Among them they record the complete story of the drop.

The telemetering equipment can be set to



Actual drop test over range provided this photo sequence showing model just before release, just after release, about to dive, and afloat after parachuting down. B-17's No. 2 propeller is feathered to cut turbulence for model.

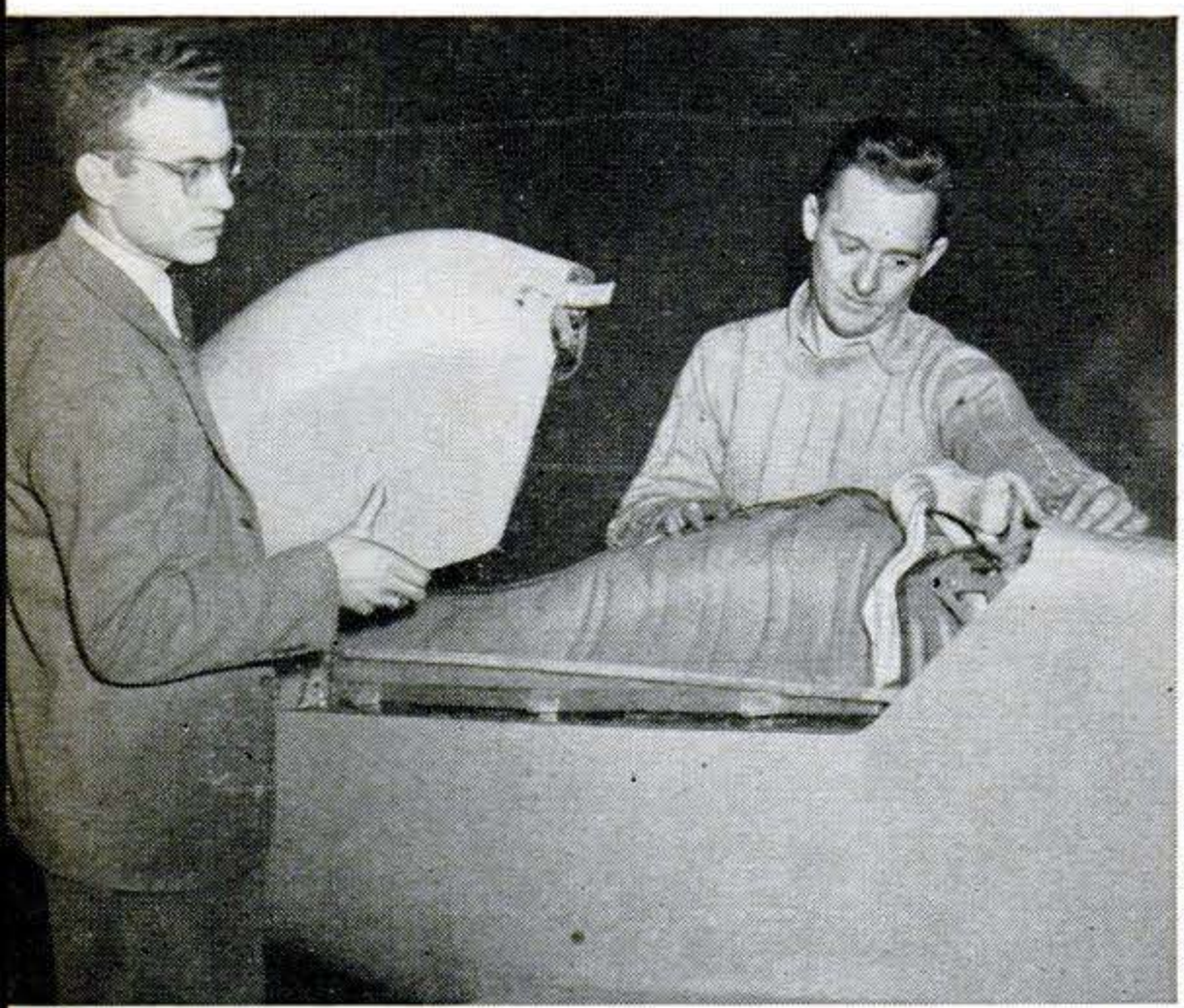
Copyrighted material



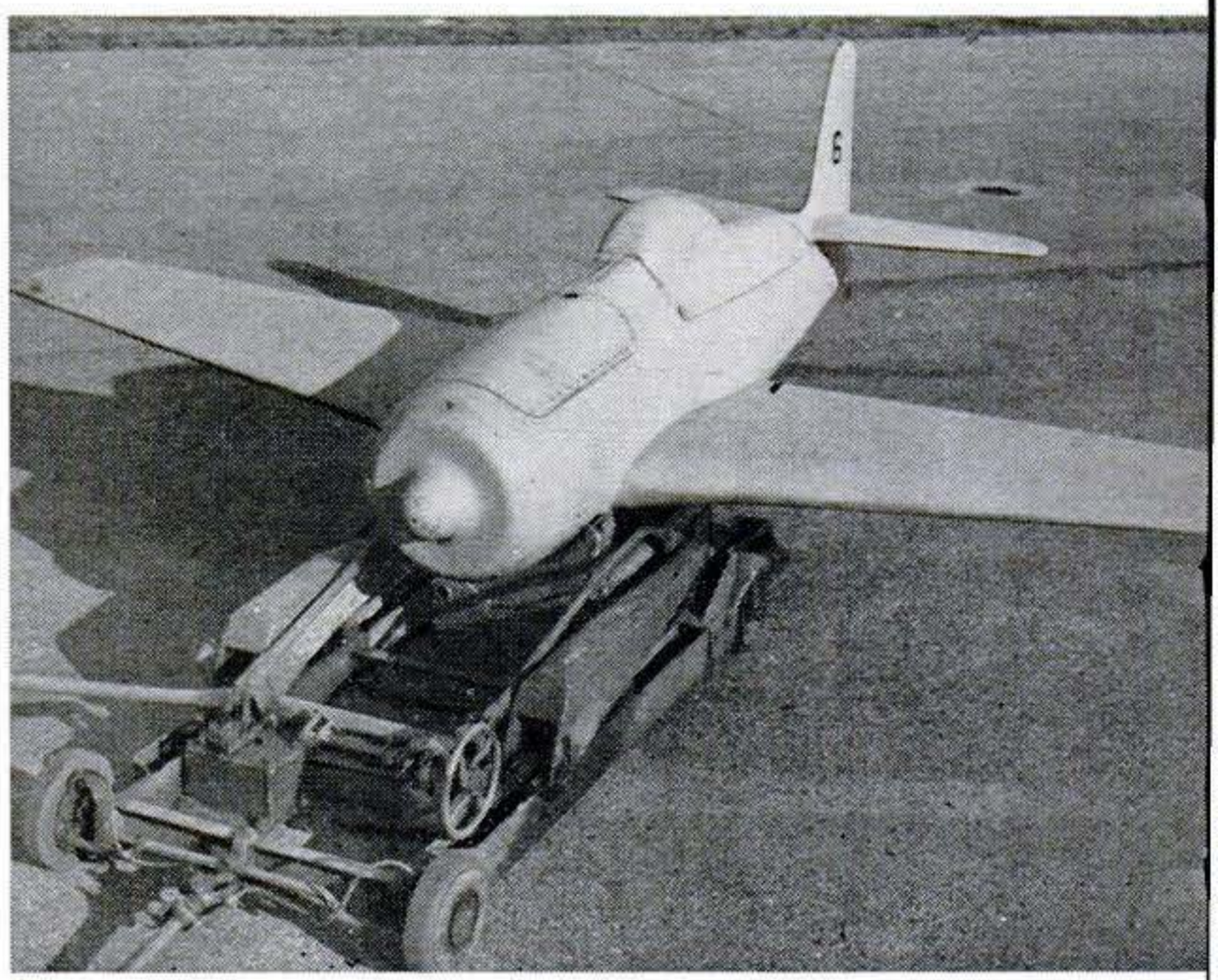
Telemetering equipment, which gives more elaborate reports than any human pilot could, is carefully tested before a flight. The cover of this compartment is also waterproof.

flash back any combination of six continuous records of pertinent flight data. These can include the readings of stress and strain gauges at important points on the model; airspeed, acceleration and G forces; position of rudder, ailerons and elevators; buffeting of controls; dive angle and angle of roll—just about everything the engineers might want to know. When plotted in simple graph form, these readings tell just what happened to the model during its flight.

Normally the gyro controls are preset to put the model into a 30° or 60° dive as soon as it is released, pull it out after it reaches terminal velocity, put it into a 40° climb, blow the nosepiece free to reduce the strain on the 'chute, and then pop the 'chute open. The controls can, however, be altered to put the model through various maneuvers and dives. Both the controls and the telemetering equipment are completely automatic once they have been started by

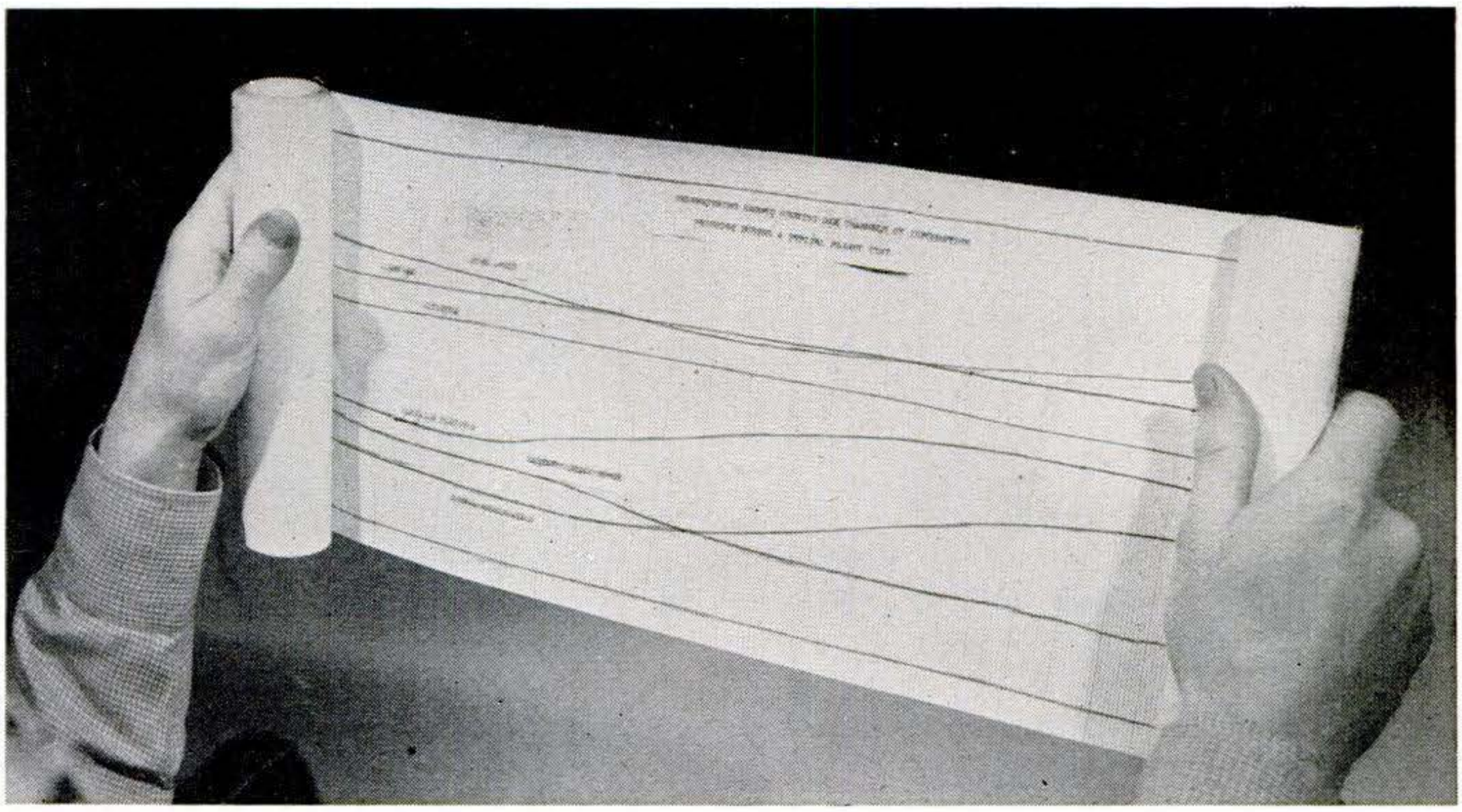


The recovery parachute is packed into place after the flight-control compartment has been sealed shut with a watertight cover. Gyro controls within are driven by compressed nitrogen.



The streamlined canopy has now been securely fastened, and the model plane is ready to be rolled out to the mother ship and fitted into the bomb rack under the left wing.

Copyrighted material

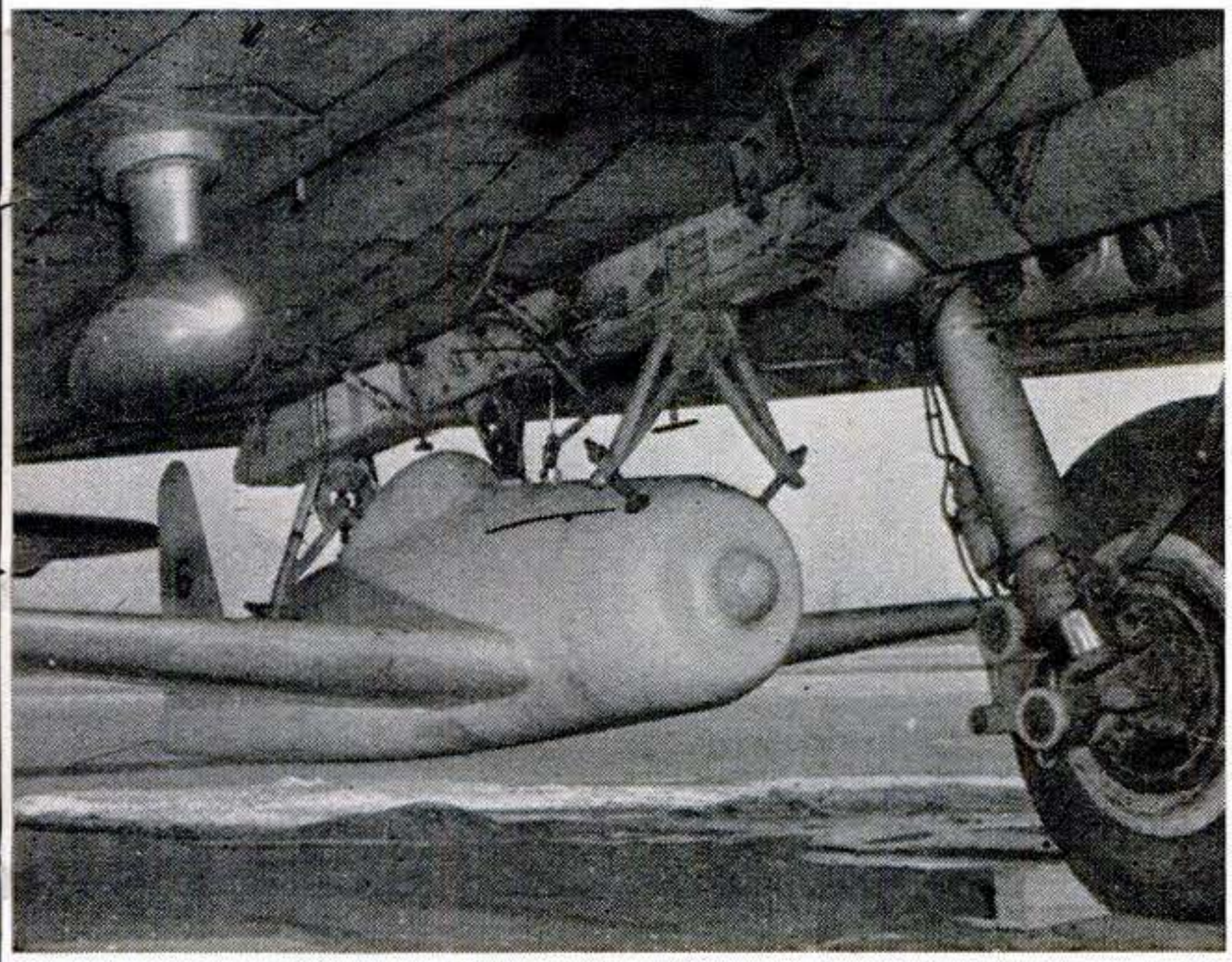


Wavy lines of this graph plotted from telemetered data tell engineers just how model reacted during its dive. With powered models, graphs may answer riddles of supersonic flight.

master switches in the mother plane. An electrical cable connecting the equipment in the model to the mother plane pulls free when the model drops away.

So far, all the models are without power —but when one is dropped at 35,000 feet it hits a terminal speed of 600 m.p.h. at 20,000 feet (roughly eight-tenths of the speed of sound at that level) just from the pull of gravity alone. Eventually jet or rocket engines may be added to blast the models through the transonic zone. Then the telemeter operators on the ground will record a vivid picture of what happens when an airplane reaches supersonic speed.

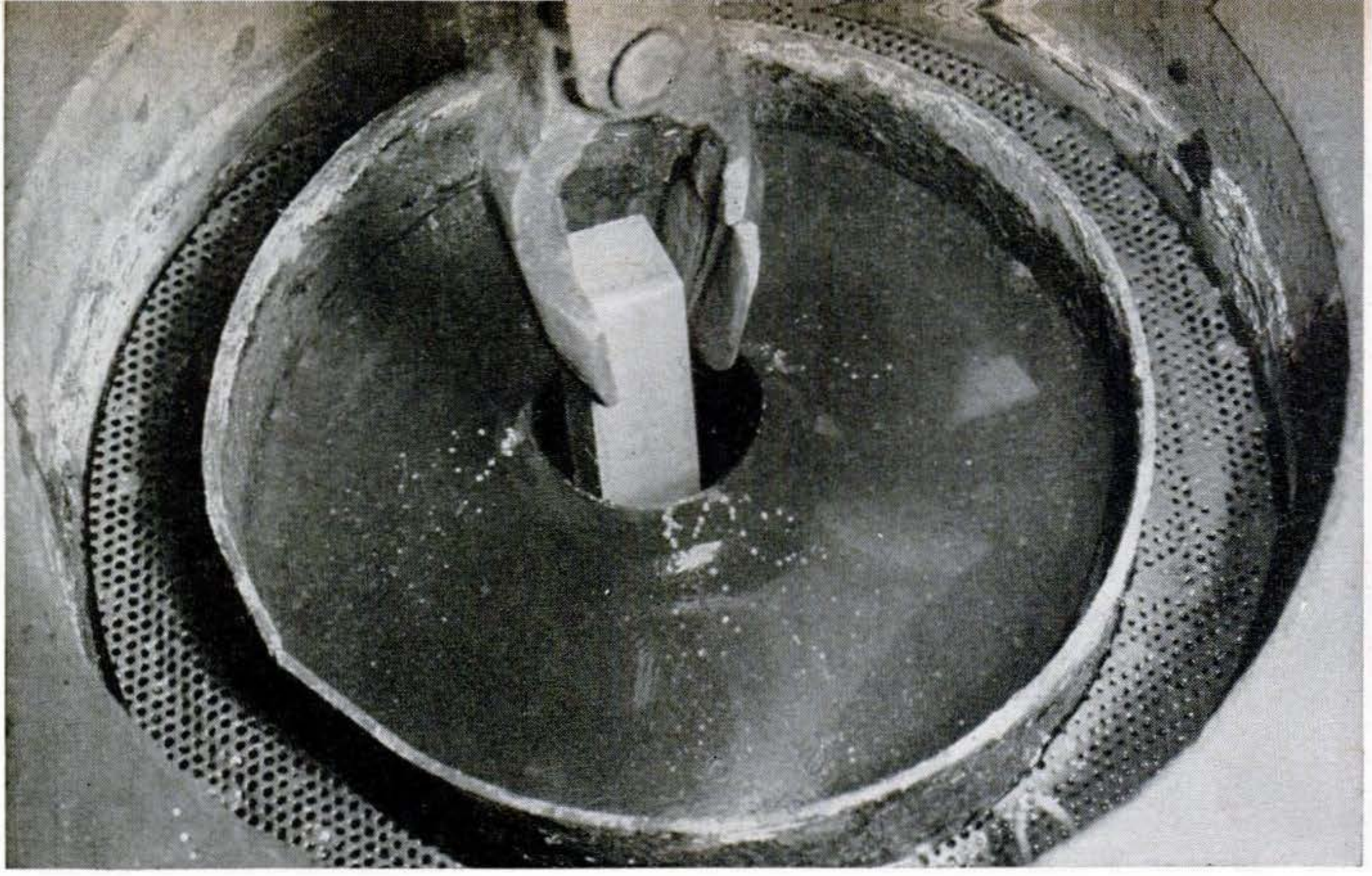
If this happens, engineers will gather their data on buffeting and the shock waves of compressibility long before a pilot touches the controls of a transonic plane. Indeed, before a full-size plane is built its design will have already been modified and perfected—thanks to the diving models. END



The model is fitted into place just to the right of No. 2 engine. B-17s were chosen for mother ships as the only large military planes whose landing gear does not interfere with models.

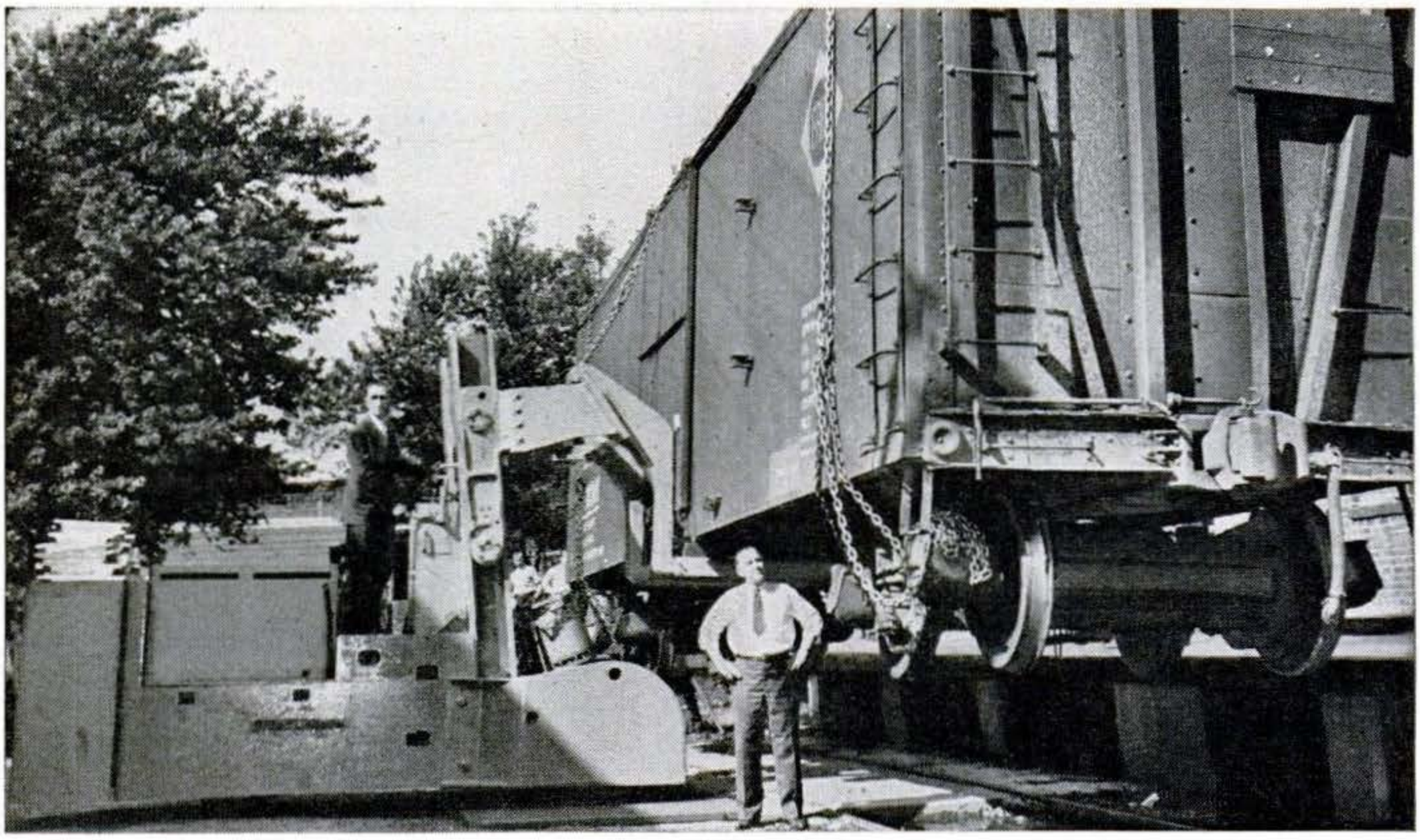
This large radar scanner tracks the model on its way down. The dive is also followed visually by a theodolite, giving a two-way check on reports sent by the telemetering equipment.

Copyrighted material



Punches Holes in Water

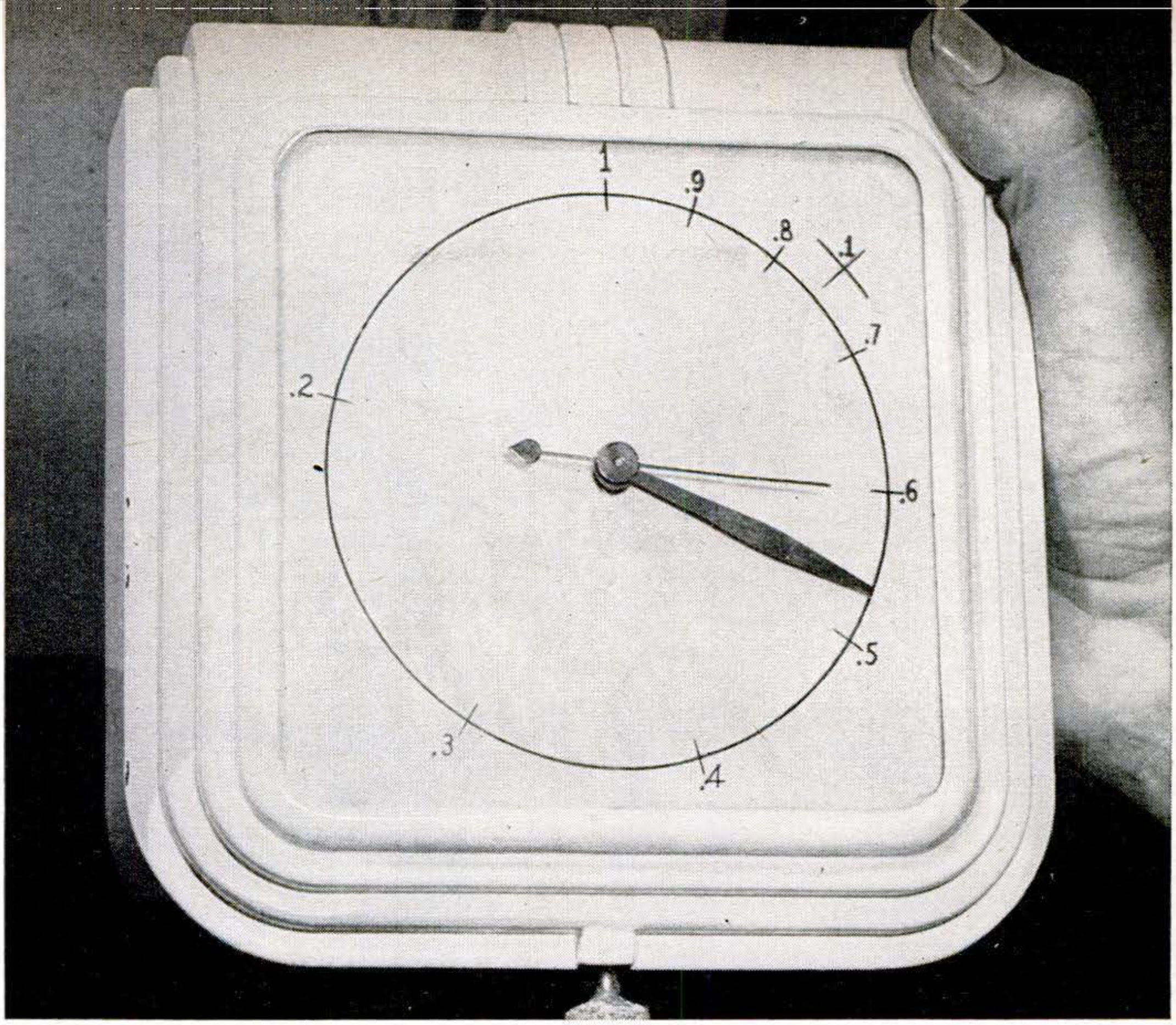
PUTTING a hole in a liquid is tough enough, but the U. S. Steel Corp. Research Laboratory in Kearny, N. J., goes one better and punches the round hole above with a square peg. It's part of a quenching operation to increase the wear resistance and hardness of steel. A white-hot steel bar is thrust into water, superheating the surrounding water to an invisible vapor. The steam, obeying the laws of gases, expands and forces the liquid away from the bar—and a round hole results because gases exert equal pressure in all directions. A 1/10,000-second stroboscopic exposure caught the "hole."



Potent Push-Up

THERE'S a new electric strongman in the steel mills—the fork and ram truck designed by B. I. Ulinski to lift and move heavy rails. In this demonstration, the automatic lift truck hoists a 45,000-lb. boxcar. It can handle loads from 10 to 30 tons.

Copyrighted material



Clock Explains "Half Life." Like radium, man-made radioisotopes emit rays and "decay" or turn into other elements. Half life, the measure of their perishability, is the time it takes half of the atoms to do this. The "decay clock" above makes the idea vividly clear.

This is an ordinary electric clock minus its hour hand. Its special dial tells the life story of a short-lived radioisotope, Carbon 11. Set to 1 at top of dial, the minute hand is started when the isotope is first made. Clock shows what fraction of the original amount of Carbon 11 remains, as hand passes figures from .9 down to .1, which it reaches in a little more than an hour on its second time around.

In the picture, the minute hand is approaching .5, which marks the half life of Carbon 11 (20½ minutes). Increasing intervals show why half life serves as yardstick. Complete decay would take an infinitely long time.

Mail-Order Isotopes

Mass production of man-made "radium" provides a wonder tool to aid international research.

By Alden P. Armagnac

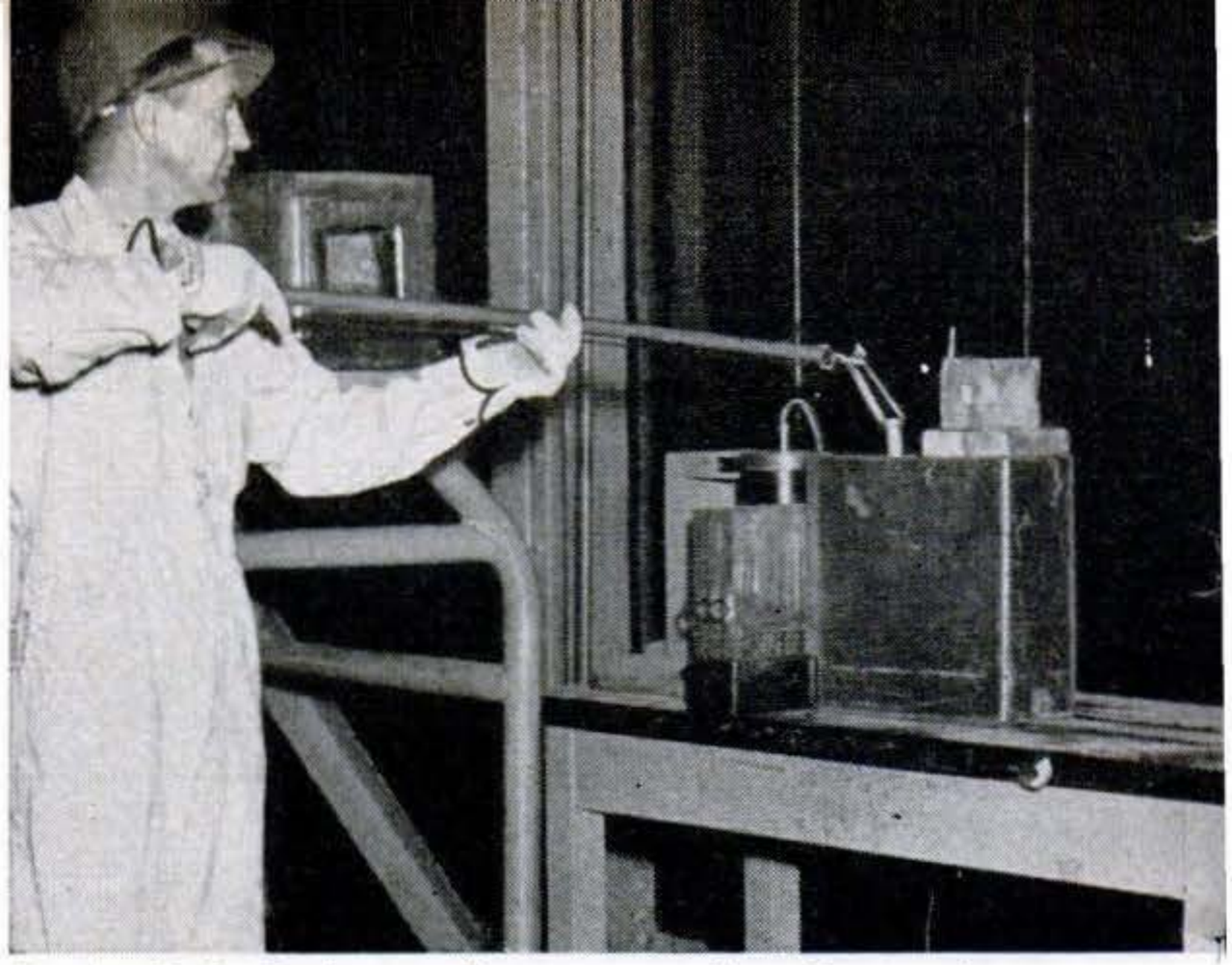
PSM photos by ***Hubert Luckett, Robert F. Smith***

A NEW era in medicine and technology began last September 5 when a lead-lined box containing radioactive phosphorus started by plane for Melbourne, Australia. Urgently needed to treat a patient with a blood disorder, it inaugurated world-wide distribution of man-made radioisotopes—"artificial radium" in layman's language—from the chain-reacting uranium pile at Oak Ridge, Tennessee.

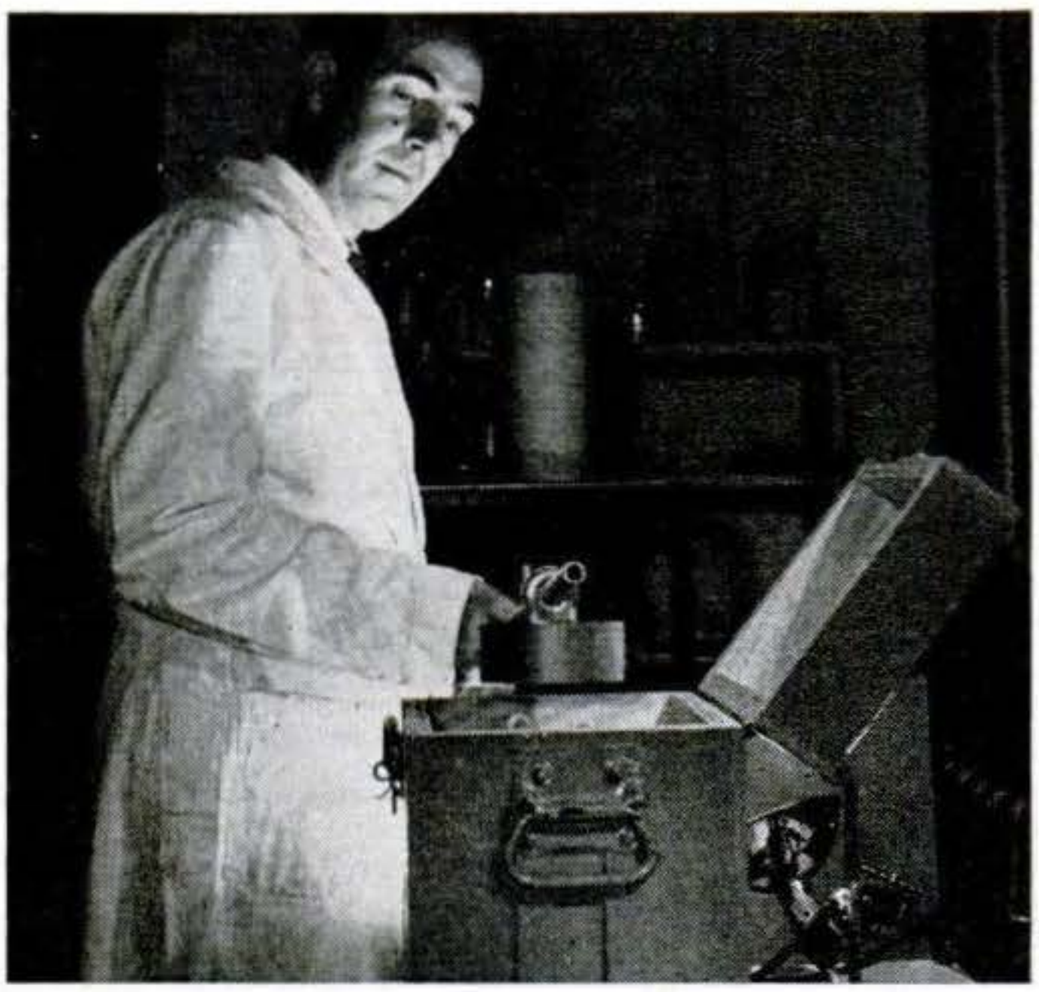
Treating disease with rays from radioactive isotopes—radioisotopes for short—has unique advantages. Injected in a vein or tissue, or simply swallowed by a patient in a tasteless solution, the radiumlike material

Copyrighted material

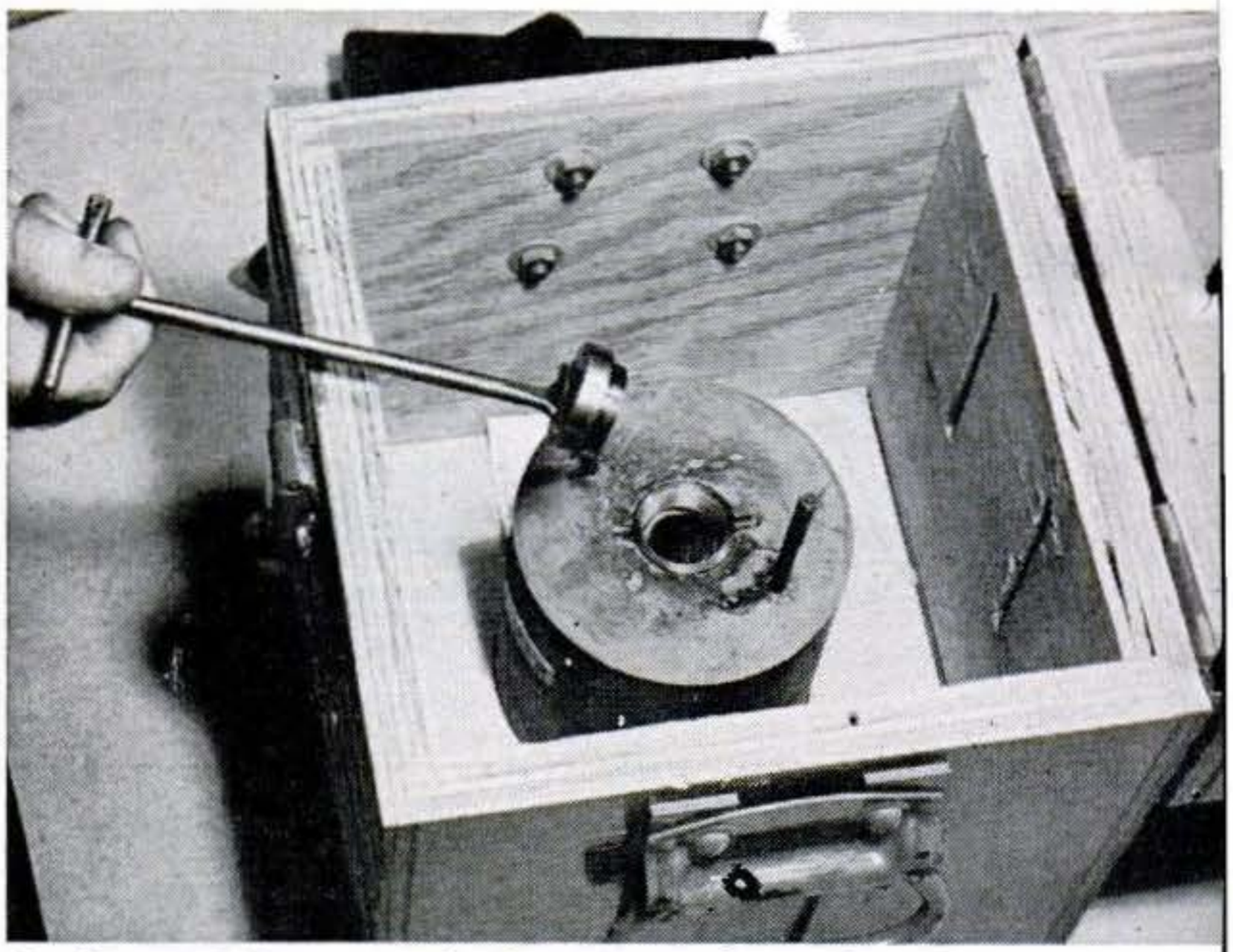
1. Dr. Ernest Pollard, of Yale physics department, fills out order blank for radioisotopes. Mail-order catalog in his hand lists radioisotopes available from Oak Ridge with prices.



2. At Oak Ridge, radioisotope taken from pile (through aperture above man's arm) has strength of rays tested before shipment. It must be handled at safe distance with aid of long tongs.



5. Treating the package with caution, despite moderate ray strength, Dr. Pollard lifts out top of lead container by inserting rod in eyebolt. Geiger counter is now clicking at rapid rate.



6. Special key supplied with package fits slot in screw top of inner, stainless-steel container so it can be unfastened and removed, as shown, without need of touching it with hands.

goes straight to the affected spot. After delivering just the proper dosage of rays, it automatically "turns them off" as its short-lived radioactivity dies away.

In another application, radioisotopes are hailed as the greatest research tool since the invention of the microscope. By definition, isotopes are varieties of a chemical element that differ in weight but possess identical chemical properties. Hence radioactive isotopes may be used as "tracers." Add the corresponding one to a natural element, and you can follow a food or drug through the body, or a chemical through an industrial process, by the telltale rays it emits.

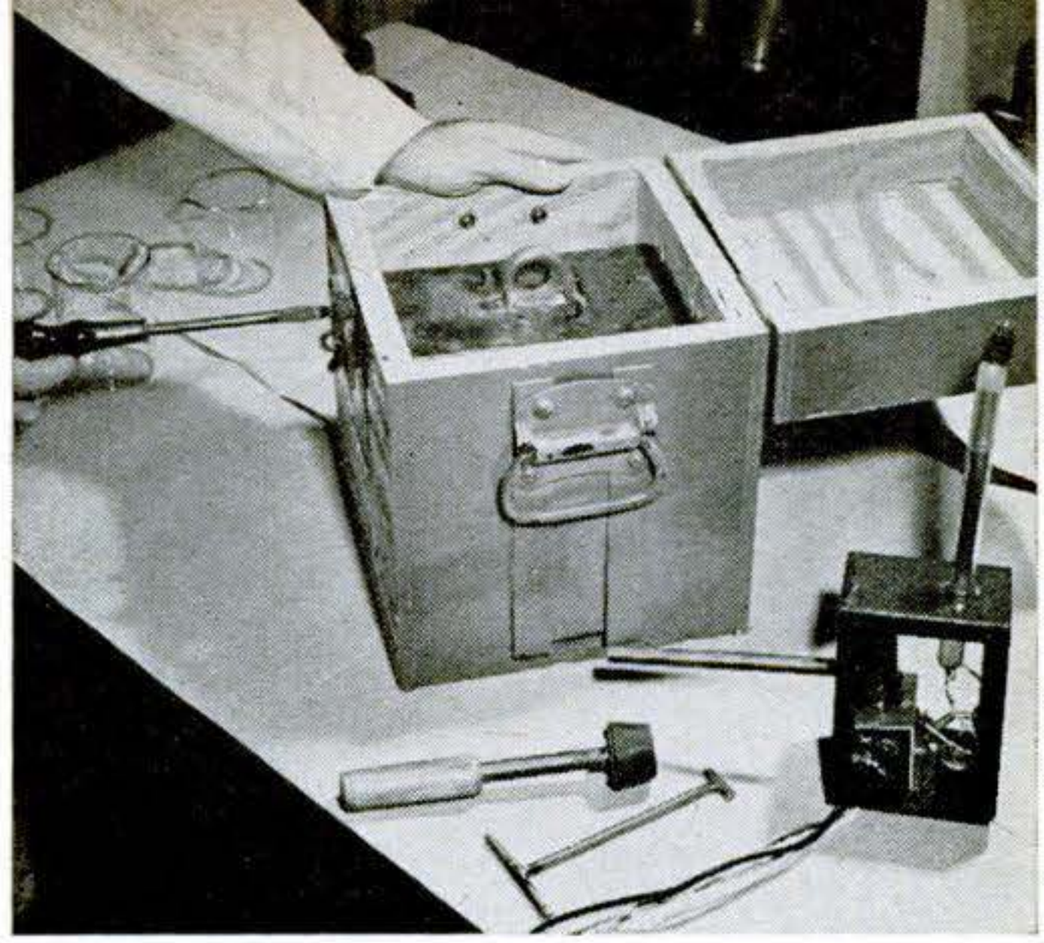
Until a little more than a year ago, radioisotopes were scarce and costly. Cyclotrons produced them in minute amounts. Fifty dollars' worth of radioactive carbon from Oak Ridge would cost $1,000,000 if made in a cyclotron.

Oak Ridge attains mass production by placing aluminum canfuls of ordinary elements in the pile and bombarding them with neutrons from the atom-bomb ingredient, uranium. Its latest blue-covered, mail-order catalog lists bargain prices for more than 90 ray-emitting isotopes of nearly 60 elements. Domestic users consumed all its first year's output. Now increased production makes the 30 most useful radioisotopes available for export.

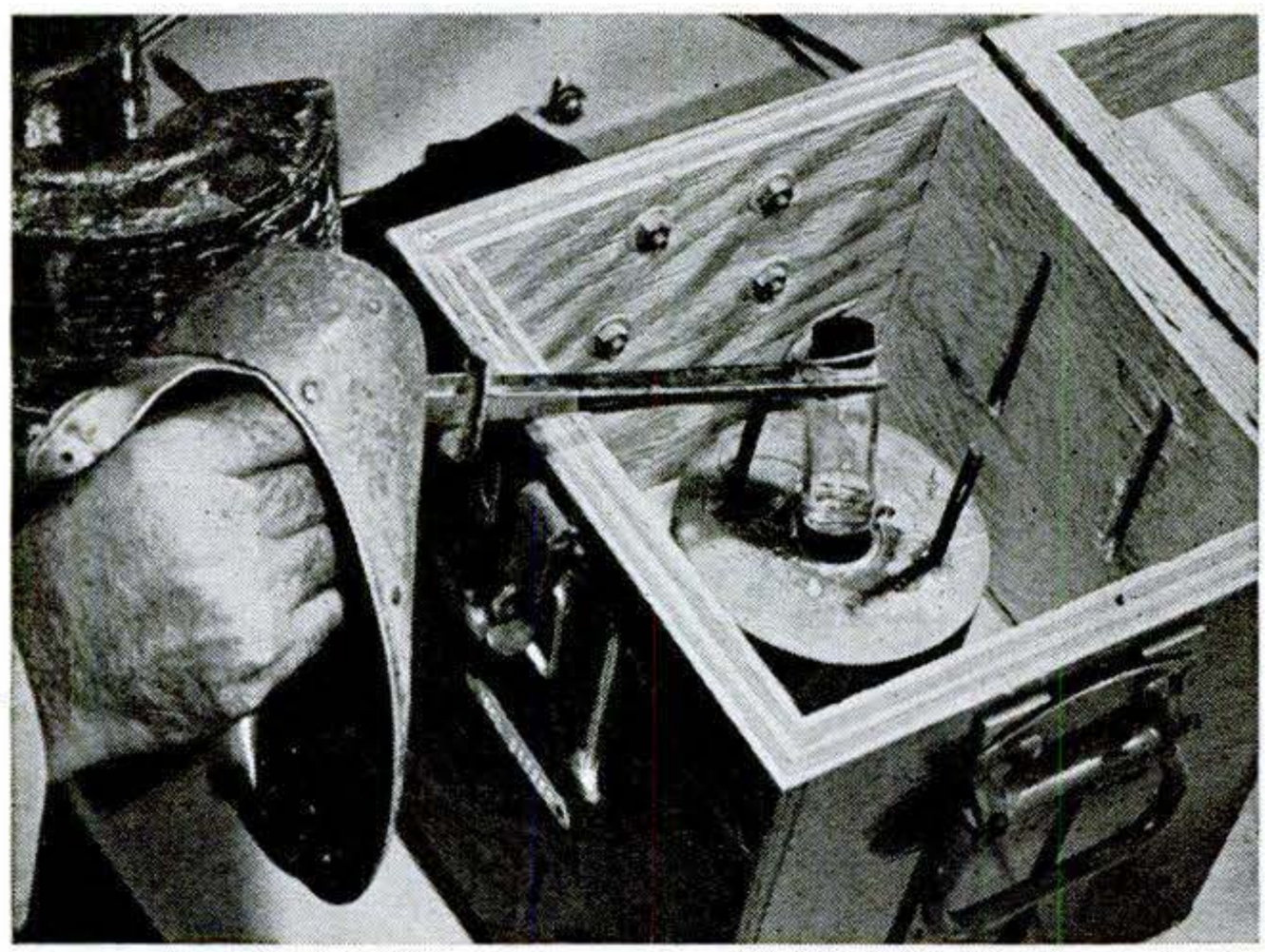
A visit to Yale University—first in America, 100 years ago, to offer classes and con-

Copyrighted material

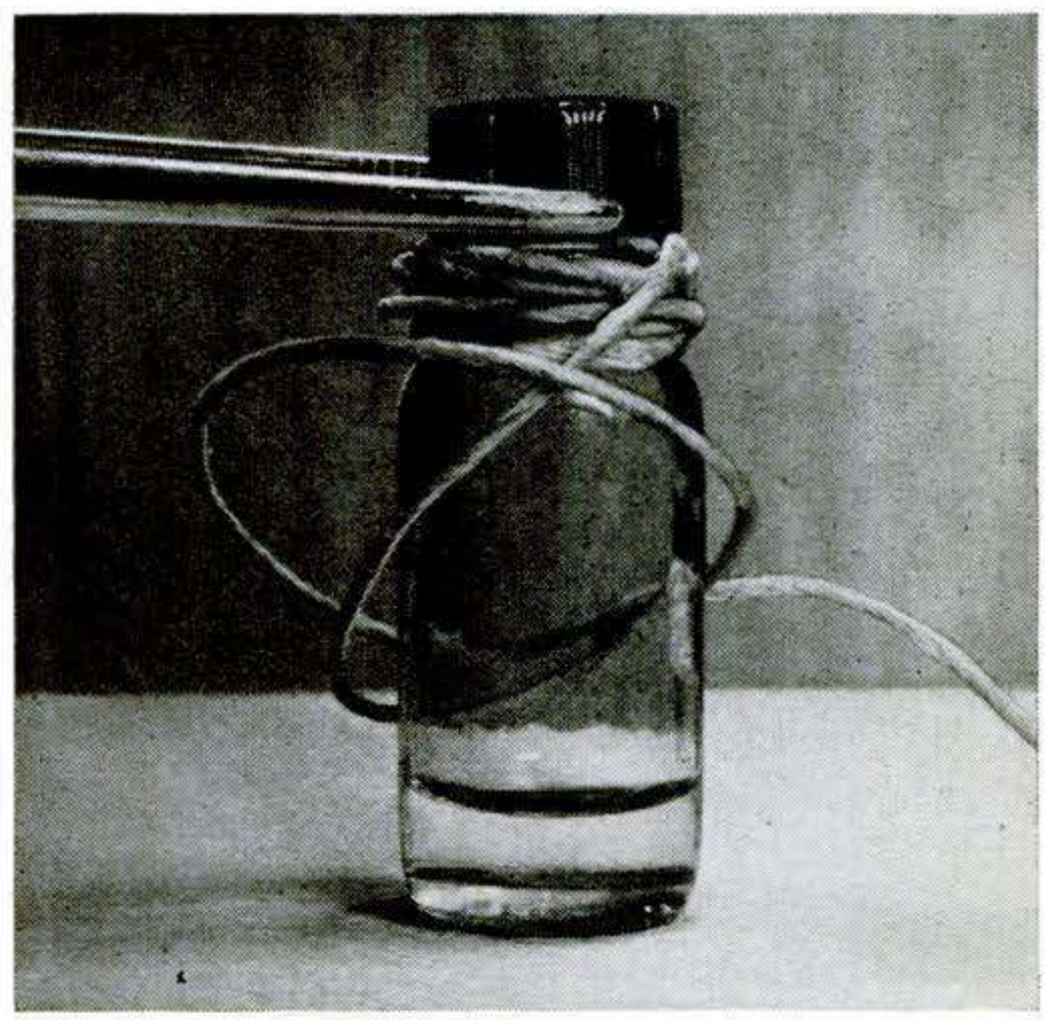
3. Lead-lined package arrives by air at New Haven, to be transferred to waiting truck and rushed to University. Most perishable radioisotope shipped has half life of 12.4 hours.



4. Removing screws of crashproof metal assembly is first step in opening package. Geiger counter, right foreground, checks how "hot" it is. This is mild one, can be handled close by.



7. Lead shield of long forceps protects hand from rays, as glass vial containing radioisotope is lifted from inside of package. This is radioactive iodine, in form of a solution.



8. Tiny vial, for which typical package weighs 100 pounds, contains about 35 drops of solution of radioiodine. It comes with string attached for carrying it at safe distance from hand.

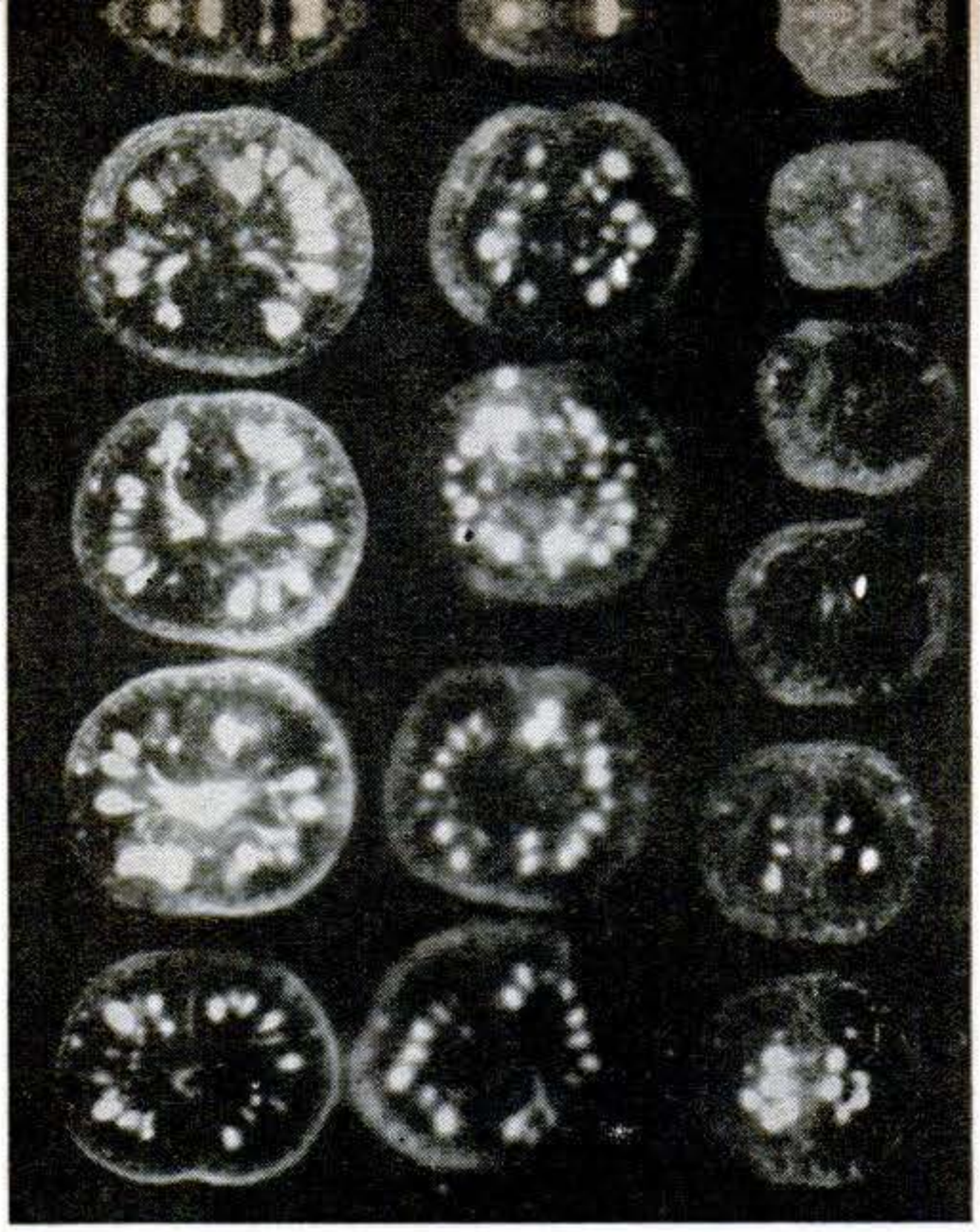
duct research in science—gives a firsthand glimpse of radioisotopes in action and the teamwork of the men who are using them.

To get the isotopes to users while they're "hot," planes and express trucks rush shipments to Yale's physics department, which handles them for other university departments. Dr. Ernest Pollard, pioneer nuclear physicist, opens them with precautions that vividly bespeak the hazards of the atomic age. Clicking like a telegraph sounder, a Geiger counter gauges the strength of invisible rays from the package, so he will know how gingerly to approach it.

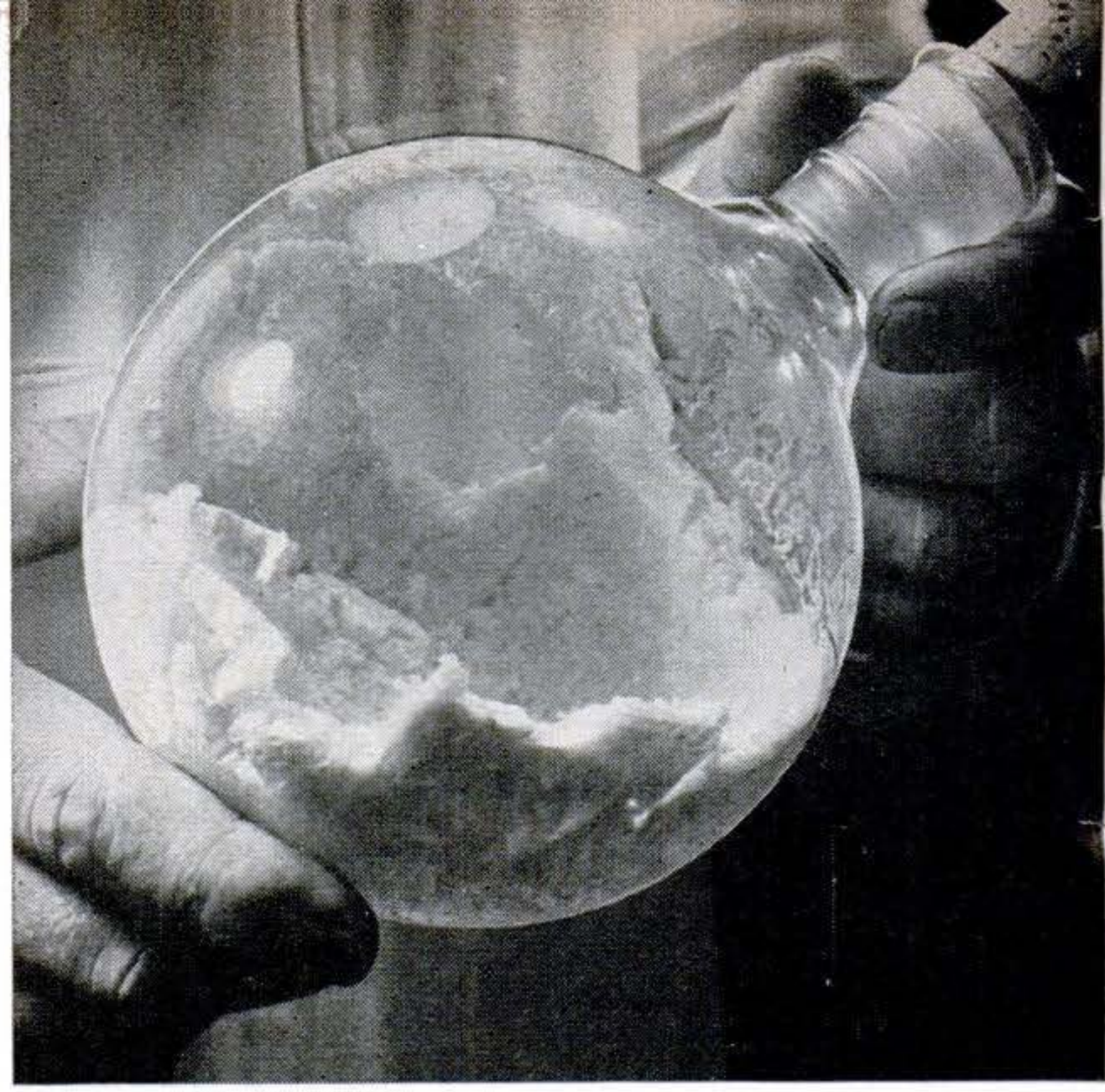
Phosphorus occurs so widely in nature, as in phosphates, that radiophosphorus figures prominently in Yale experiments. To obtain a successful vaccine against the bacillus of dysentery, Dr. Henry P. Treffers seeks to learn how its deadly toxin kills. By raising the germs in a nutrient medium containing radiophosphorus, he "tags" the toxin with it. Filtering off the toxin, injecting it in laboratory animals, and tracking it through their bodies with a Geiger counter, he finds out just what organs it affects. Hen's eggs injected with radiophosphorus tell Dr. Edward W. Shrigley, who uses them as germ incubators, what the virus of influenza feeds upon. Using radiophosphorus on wild-flower pollen, Dr. Norman H. Giles, Jr., investigates mutations or freaks induced by radioactivity.

Because of the peculiar affinity for iodine

Copyrighted material



Slices of tomato from plant nourished with radioactive zinc take their own picture when laid on photographic plate. Rays from isotope made this "radioautograph," showing zinc concentrated in seeds. (Photo from N. V. Philips' Gloeilampenfabrieken, Eindhoven, Holland.)



Deadly toxin of dysentery bacillus, the fluffy white substance in flask above, is "tagged" with radiophosphorus by Dr. Henry P. Treffers, of Yale medical school, to find out how it kills. When toxin is injected in animals, its course through body can be traced by rays emitted.

of thyroid tissue, radioiodine gives Dr. William T. Salter a triple-edged weapon against thyroid cancer. When cancerous cells migrate from the thyroid gland and settle elsewhere, a mild dose of radioiodine and a Geiger counter promptly detect the new focus of infection. A more powerful dose of radioiodine, used for therapy, bombards a cancerous growth at point-blank range and temporarily destroys it—a treatment to which a number of patients owe their lives. Thyroid glands from radioiodine-treated rats, placed on photo film, take their own pictures—"radioautographs"—which may lead to a more permanent cure.

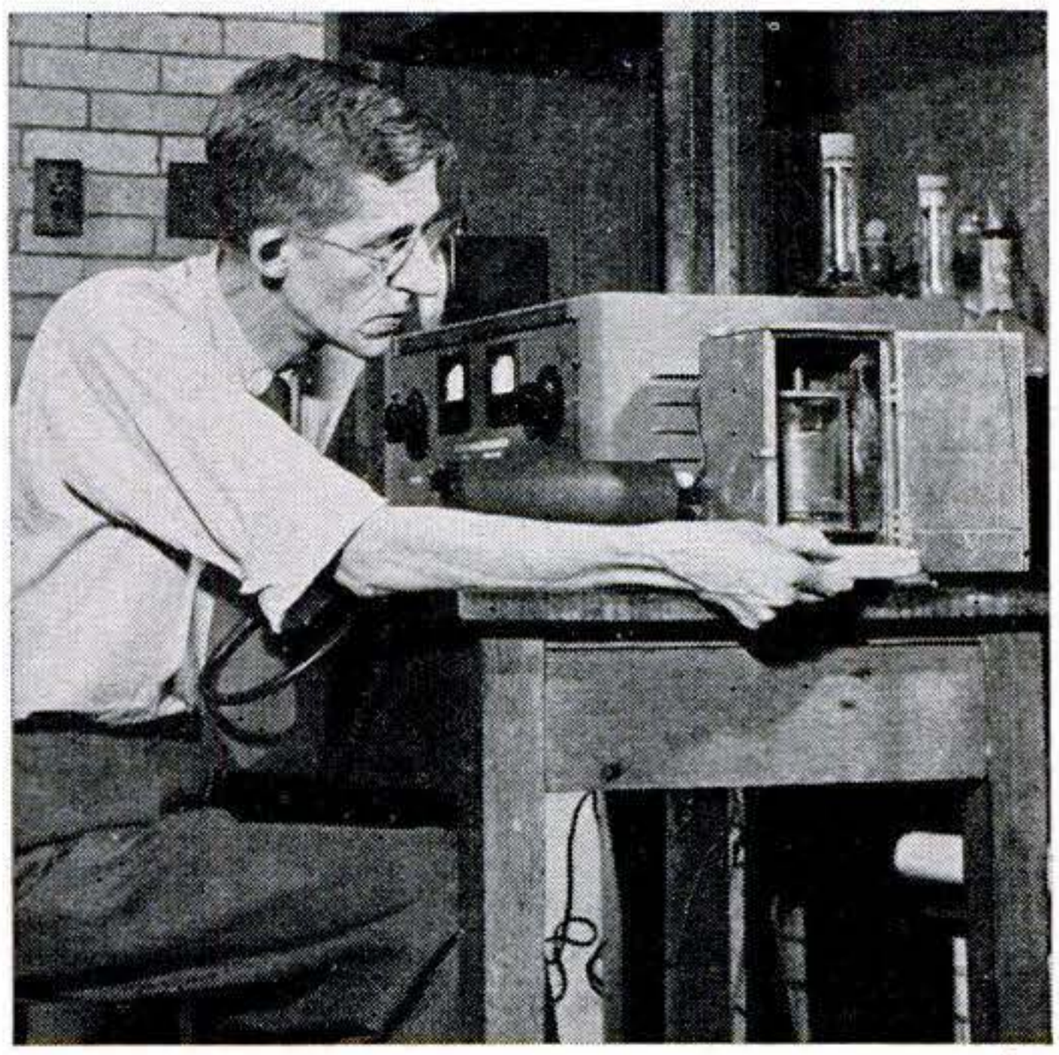
Radiomanganese may answer a teasing question for Vaughan T. Bowen, research assistant in zoology. Why do wasps and clams, two apparently unrelated members of the animal kingdom, contain 40 to 50 times as much manganese as other creatures? Yale's 27-inch cyclotron supplies this "homemade" radioisotope, which cannot be made by neutron bombardment in the pile. The cyclotron also provides isotopes too short-lived to be shipped from Oak Ridge.

Some of the most perishable, shortest-lived isotopes enable Dr. Pollard to explore unprobed mysteries of the atom's nucleus in the physics department—research so important that it is supported by funds from the Office of Naval Research in Washington, D. C. It takes fast footwork to get a sample of radioactive neon gas from the cyclotron to a near-by laboratory in time to measure the energy of its rays with a magnetic lens, for it has a half life of only 40 seconds. Radioactive argon gas, used in a diffusion experiment, has a half life of two hours. A "decay clock" devised by Dr. Pollard (page 87) shows experimenters at a glance how fast their material, and its rays, are running out. Interchangeable dials adapt the clock for different isotopes.

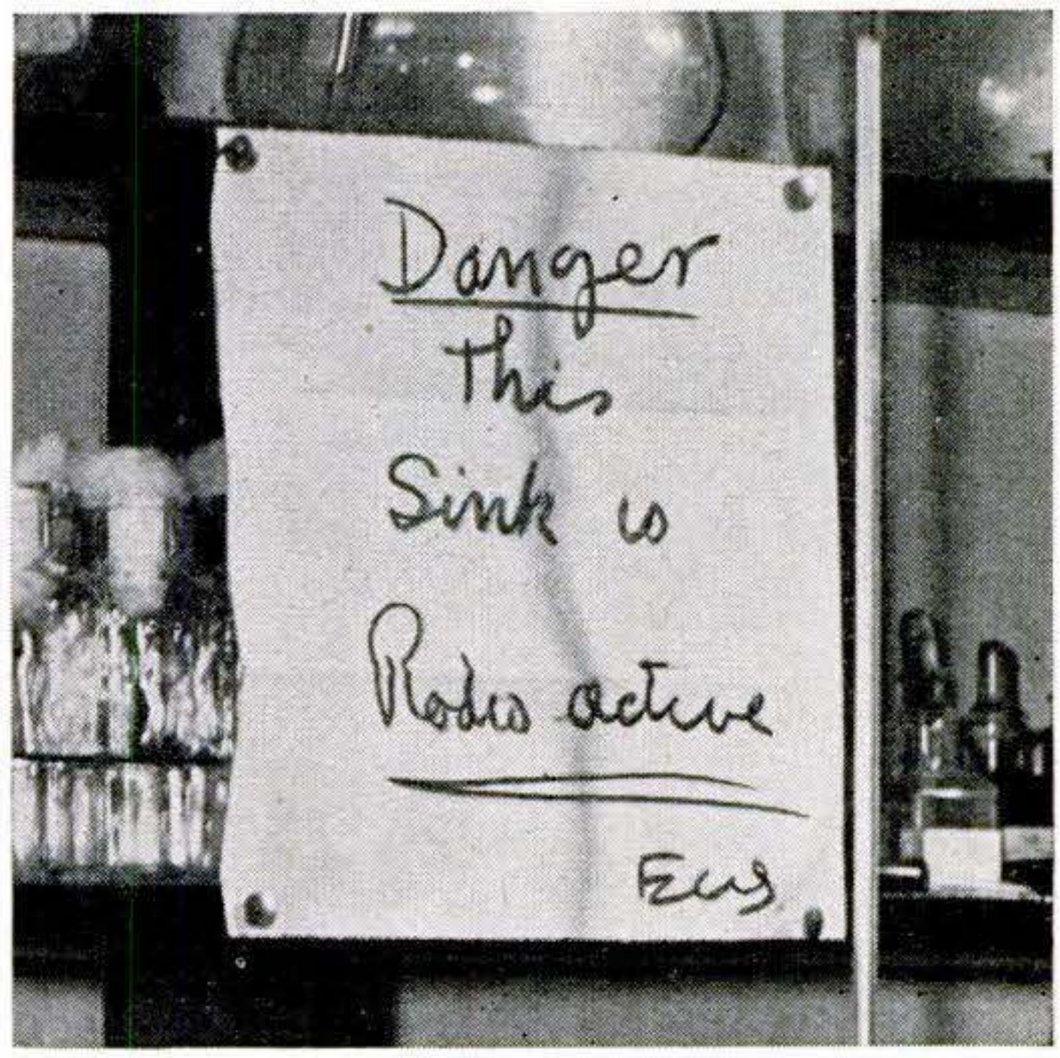
It was in Yale's physics department, in 1906, that Prof. Bertram B. Boltwood started off the list of known isotopes by discovering ionium, a lightweight twin of thorium. More than 670 isotopes have been found since then. About 270 of them are stable, like ordinary and double-weight hydrogen in "heavy water," or the 10 isotopes of tin to be found in the ordinary metal. The rest are radioactive, ranging in half life from less than a millionth of a second to more than 100 billion years. Most of these are man-made and unknown in nature. During the first year that they have been available in quantity, experimenters have hardly had time to do more than perfect the technique of working with them. Now, these new tools may reveal untold wonders. END

Copyrighted material

Secrets of forces between atoms are sought in diffusion apparatus at Yale physics laboratory. Tubes opposite central disk contain ordinary and radioactive argon gas. Observer has just opened aperture between tubes, allowing gases to mix. To measure speed of mingling, or diffusion, he is peering into eyepiece of one of a pair of Lauritsen electroscopes mounted at outer ends of tubes. Movement of a hairline across a graduated field shows rate of increase in radioactivity at one end and decrease at other end, as the tubes exchange atoms.

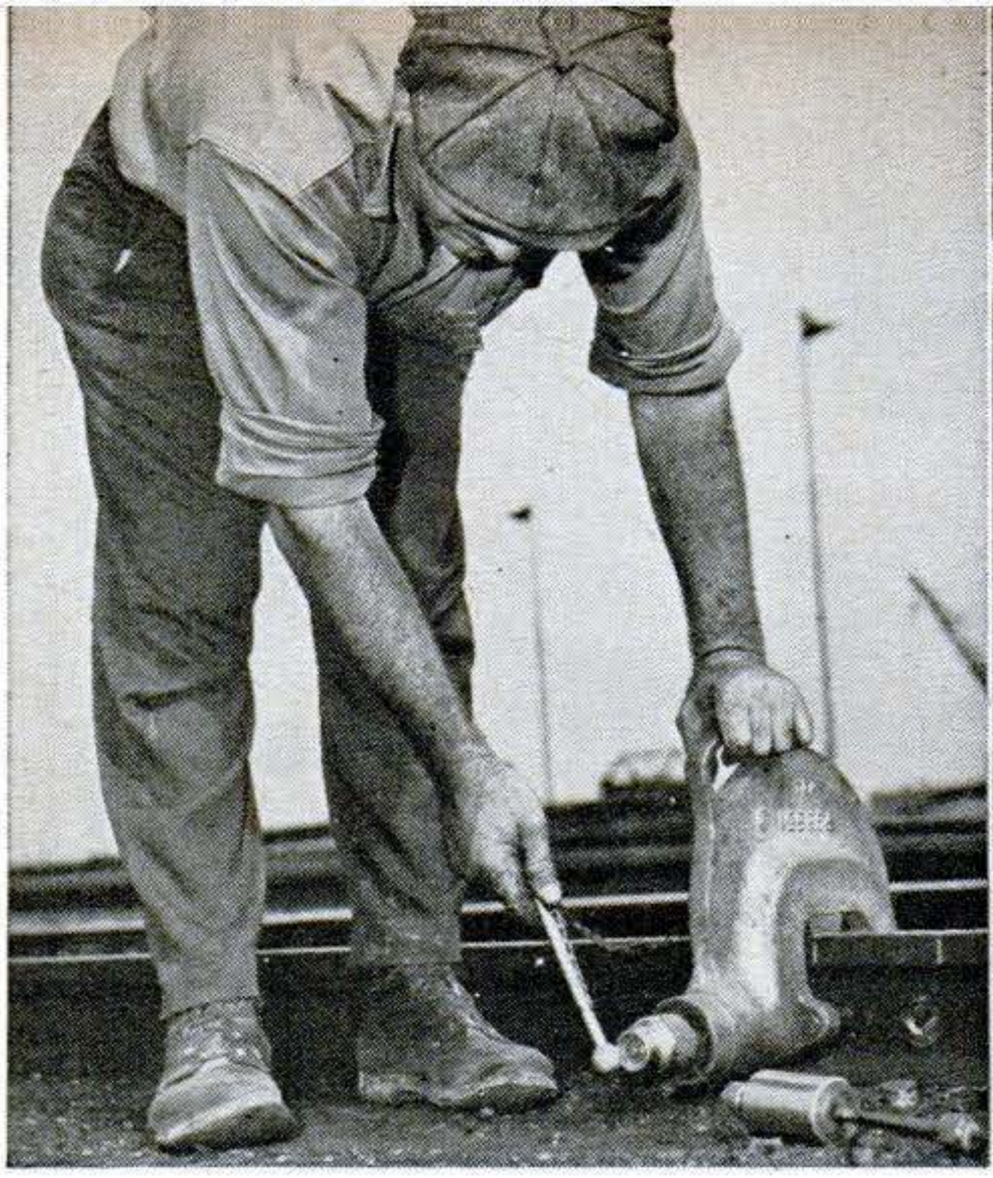


Hitherto unknown sources of natural radioactivity are sought by Dr. George M. Murphy of Yale chemistry department. Separating isotopes of rare-earth elements with adsorption column containing organic resin, he tests concentrate for rays with Geiger counter above.



Getting rid of used radioisotopes may pose future problem. Experimenters in this Yale laboratory pour them down drain. Sign warns of lingering rays that would contaminate laboratory glassware washed in the sink. They are too weak, however, to menace health of workers.

Copyrighted material

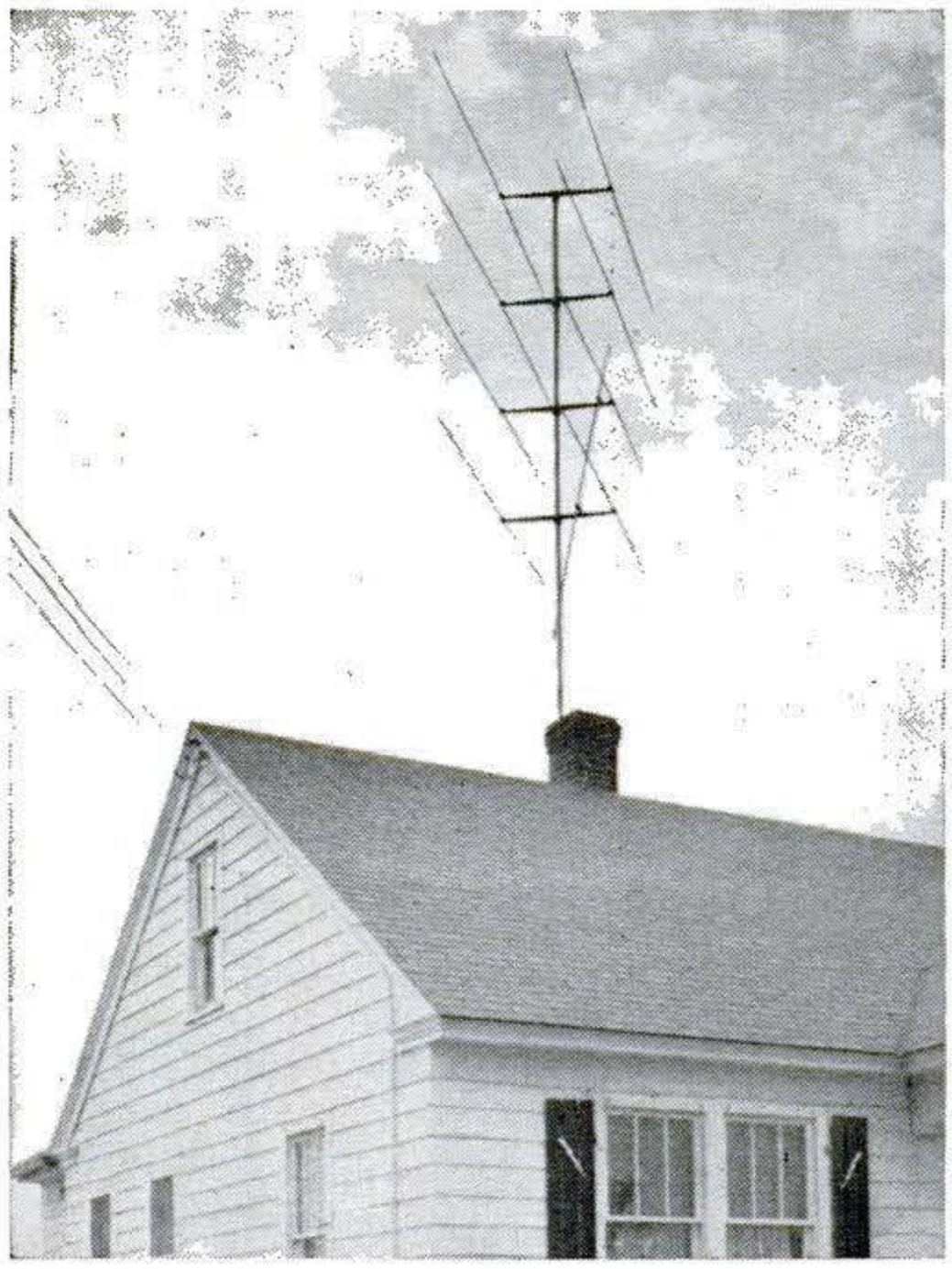


Gun Shoots Rail Holes

THIS "cannon" speeds track-laying by shooting holes in steel rails. Made by Mine Safety Appliance Co., the 45-pound gun uses a cartridge slightly larger than a .45 to blast a punch through ¾-inch steel. Tapping firing pin, at left above, sets it off. At right are (l. to r.) the gun, cartridge, barrel, punch, and breech; in foreground is a compressed-air ramrod. Punch—and resulting hole—can be up to 1½ inches in diameter.

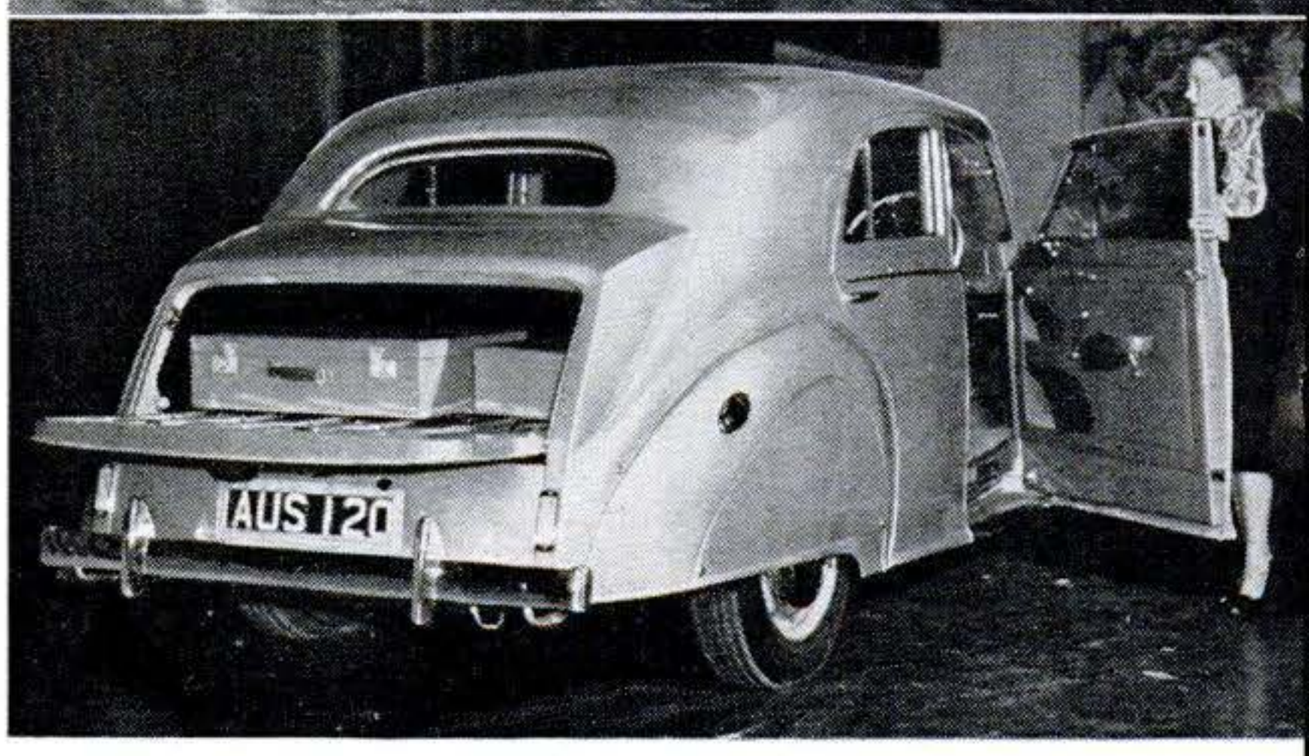
Antenna Stretches Tele

THE Vee-D-X, a new long-distance antenna, makes television reception possible as far as 125 miles. It has high forward pickup, but little at sides and back, minimizing interference. Easily installed, it weighs 25 lb., has low wind resistance.



Baby Austins Grow Up

THESE full-size, luxurious cars are two of the four new British-made Austins that will make their debut in 1948. The "Sheerline" (top, below) has a 6-cylinder, 130-hp. engine; the "Princess" (bottom) boasts 10 hp. more and many special features.



Copyrighted material

How Germans Build Mud Homes

GERMANS struggling to rebuild their shattered homes are going right back to Mother Earth. Dried mud blocks are being used for houses in a new settlement on a one-time drill field near Frankfort on Main.

Twenty-six houses, each of four or five rooms and a basement, are to be completed this year. Some will be of prefabricated pressed wood and cement construction. The group, sponsored by the German Evangelical Relief organization, plans to expand as more building materials become available.

First step is to dig clay for the building blocks. Handcars are used to carry the material to a central point where it is mechanically mixed with loam and other ingredients.

A former bank clerk removes a mud block from the wooden mold in which he formed it. In background are stacks of blocks piled up to dry. Process is similar to making adobe brick.

The first mud block is set on top of the stone wall that forms the foundation of a house. White collar workers—including a former missionary—are members of the working crew.

After the walls are up and the roof on, workers polish the face of the earth blocks and coat them with a gypsum mixture to keep out moisture. Untreated wall can be seen at left.

Copyrighted material

The Microwaves Are

Invisible network will handle phone calls, telegrams, television, FM and AM broadcasts, complete newspapers—even carry your mail.

By Martin Mann

PSM photos by Robert F. Smith

COMMUNICATIONS are being revolutionized faster than you think. The humming wires beside the highways already are rivaled by new systems, capable of transmitting more spoken or written words and more still or moving pictures from coast to coast. The difference between these new systems and those of the past is as great as that between oxcarts and stratoliners. Radio relay systems, coaxial cables, and other improvements in communications systems soon will bring you not only better, faster services such as you already know, but also completely new kinds of service.

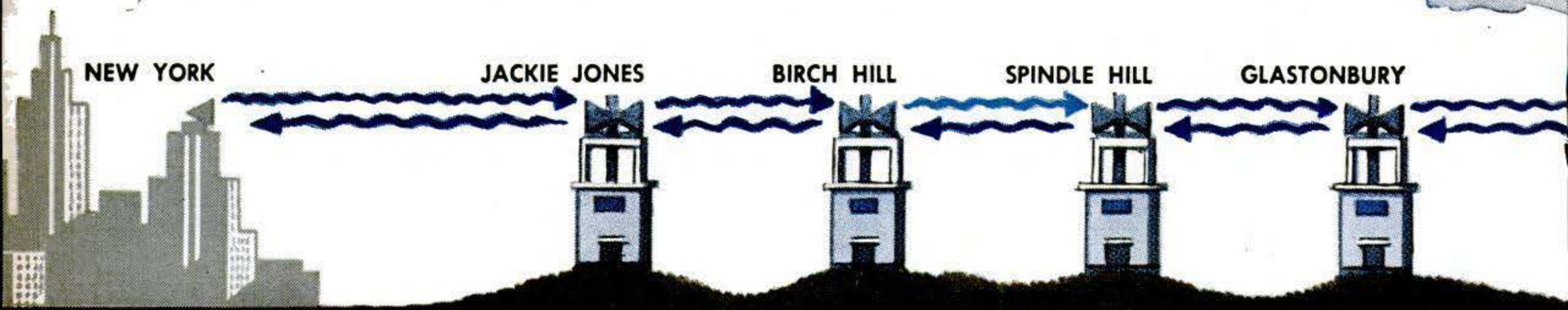
Your radio program now comes to you in waves a fifth of a mile long. Your son's television program, and his telegrams and long-distance phone calls—even his mail—will come to him in waves only two or three inches long. Telegrams are now flying between New York and Philadelphia in these microwaves; phone calls will be made in microwaves next year between New York and Boston; and television shows are being sent this way now from New York to Schenectady and Philadelphia.

These microwave relays use invisible beams in the air instead of wires. No poles support them. The poles and wires are replaced by steel or concrete towers every 30 miles or so. On these towers are antennas that catch the microwaves, shunt them down to repeater equipment to be amplified, then send them on to the next station.

These relay stations are as automatic as electric refrigerators—designed to operate with only occasional human supervision. If a tube fails, its duplicate is standing by, ready to switch into operation immediately without interrupting service—and at the same time to flash a trouble signal to the nearest testboard. A furnace heats each tower building in winter and in the summer it is cooled by air-conditioning devices for the machinery's benefit. Banks of batteries and current from the local utility companies supply the power. In some stations, a gasoline generator automatically starts itself and takes over the job of charging the batteries if the utility lines fail.

You will not notice any difference when your phone calls begin to go through these radio relays. On a call from New York to Boston, for example, your voice will travel as usual from the handset through the switchboard into a trunk line for Boston. That trunk line now is a thick copper, rubber, and lead cable buried in a ditch along the Atlantic coastline. When radio relay is used, however, the cable carrying your voice will end on the roof of the telephone building in lower Manhattan. There it will feed into a microwave transmitter, aimed at the first relay station atop Jackie Jones Mountain, N. Y., 35 miles away.

At Jackie Jones, a strange antenna that looks like a big square metal funnel will receive the beam. This antenna is a set of criss-crossing metal plates that focus microwaves into a narrow beam. From this lens, the beam will travel down into the tower to amplifiers, to be strengthened after its 35-mile trip. It will then go back up to a



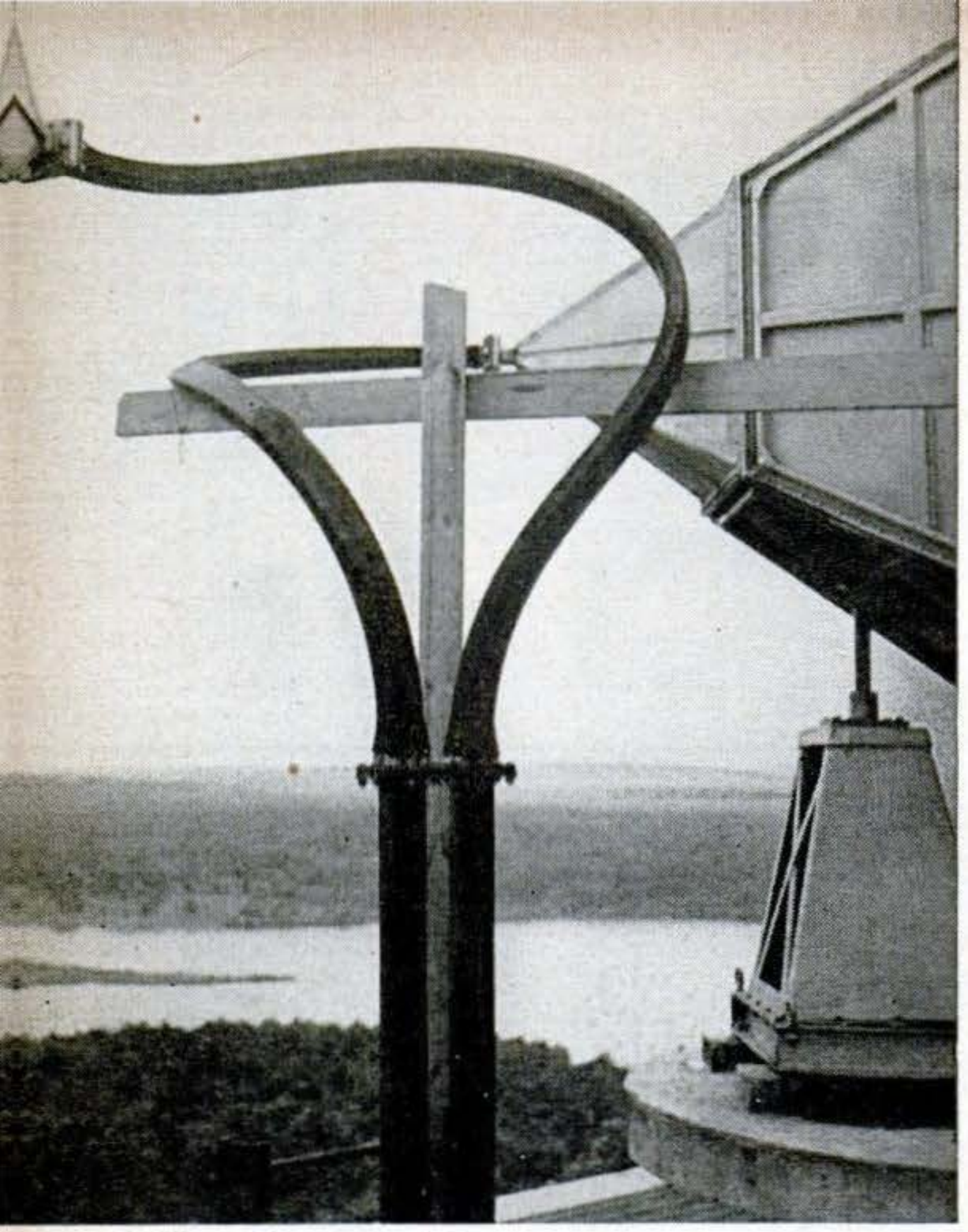
Seven automatic towers will relay microwave beams from New York to Boston in a

Copyrighted material

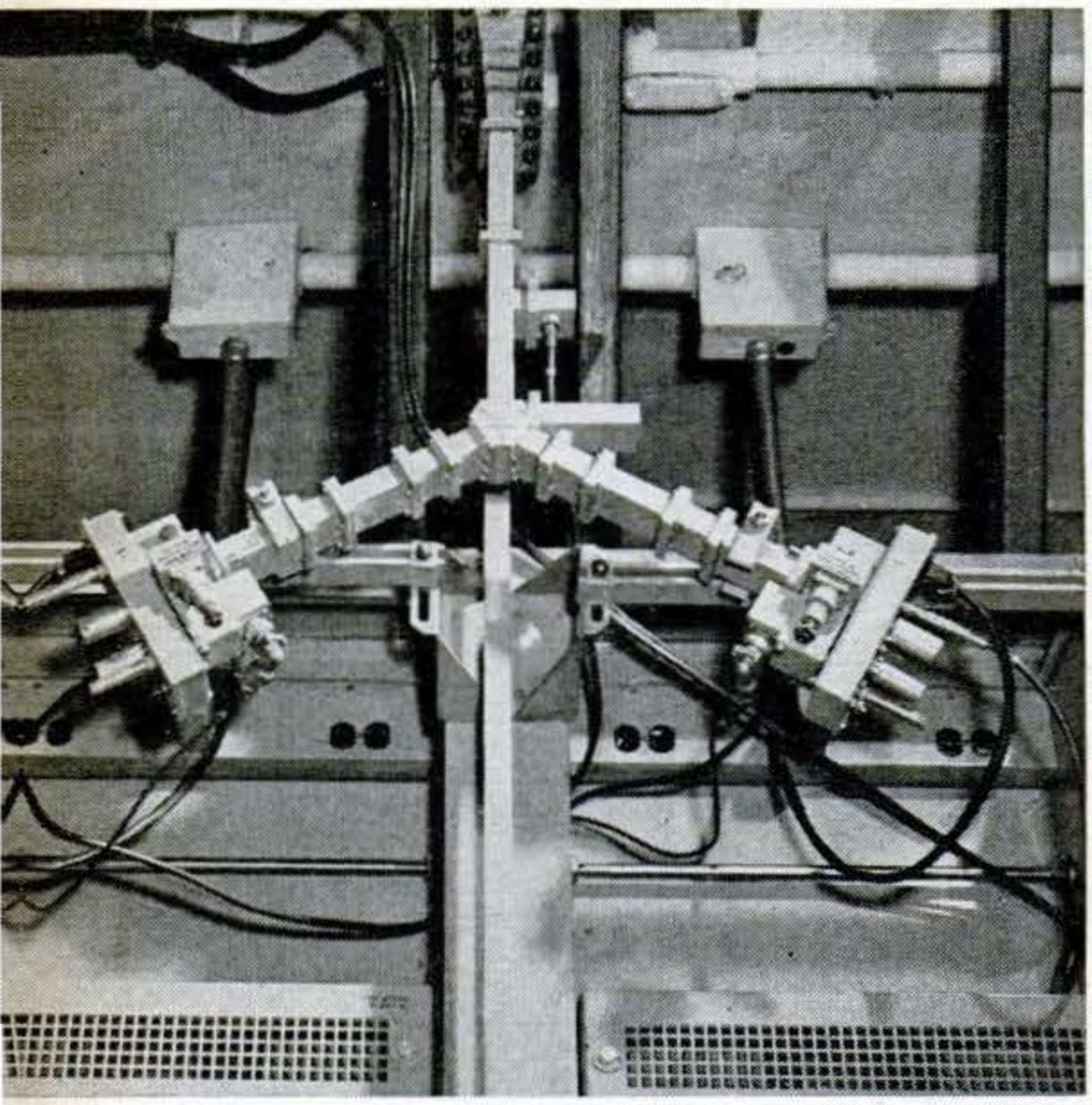
Coming!

telephone system, soon to begin operation. Large picture shows layout of one tower.

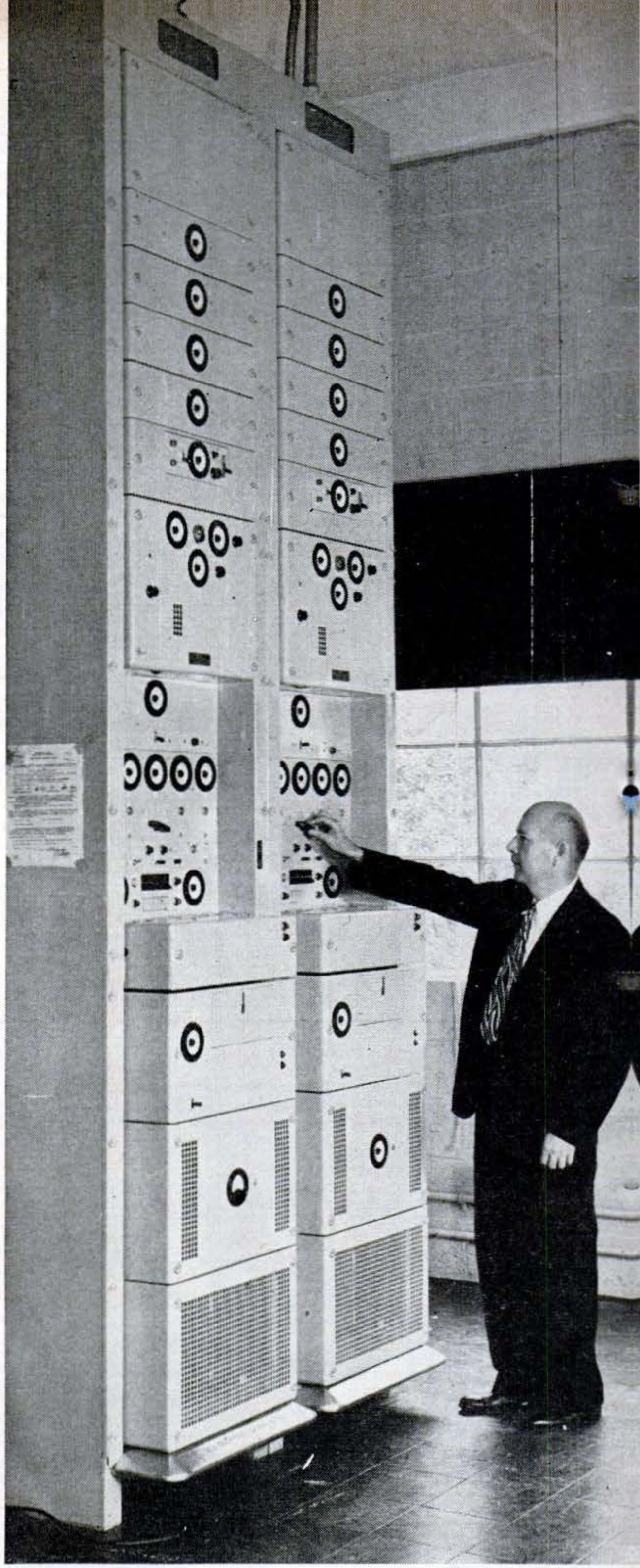
Copyrighted material



Hornlike metal lenses serve as antennas, one receiving, the other transmitting, microwaves. They focus the waves into narrow beams the way light is focused by glass lenses. The focused beams travel to and from the amplifiers below in the gracefully curving wave guides, which are hollow square copper pipes.



After passing through the roof, the wave guides come down behind the amplifiers and divide into Ys that split the beam into two channels. The Y shown is the receiving end; transmitting Y is near bottom of amplifier.



An engineer adjusts amplifying equipment on one of the two microwave channels from this relay tower to the terminal station. A similar pair of amplifying panels (out of picture to left) controls channels going the other way.

Copyrighted material

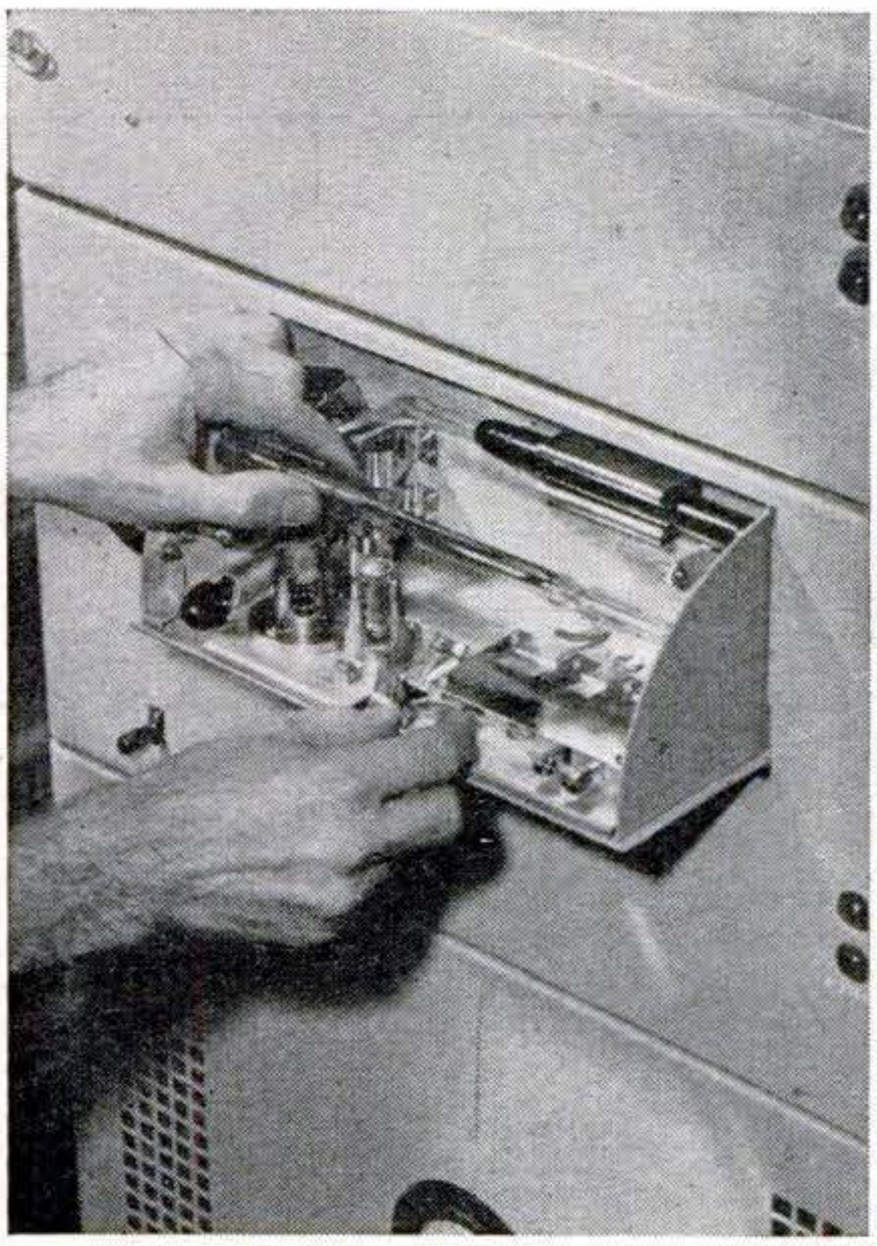
second lens, which will aim it at the next relay station on Birch Hill in Connecticut. This process will be repeated in each of seven relay stations until your voice reaches the receiving lens on the Boston telephone building and goes into wires again.

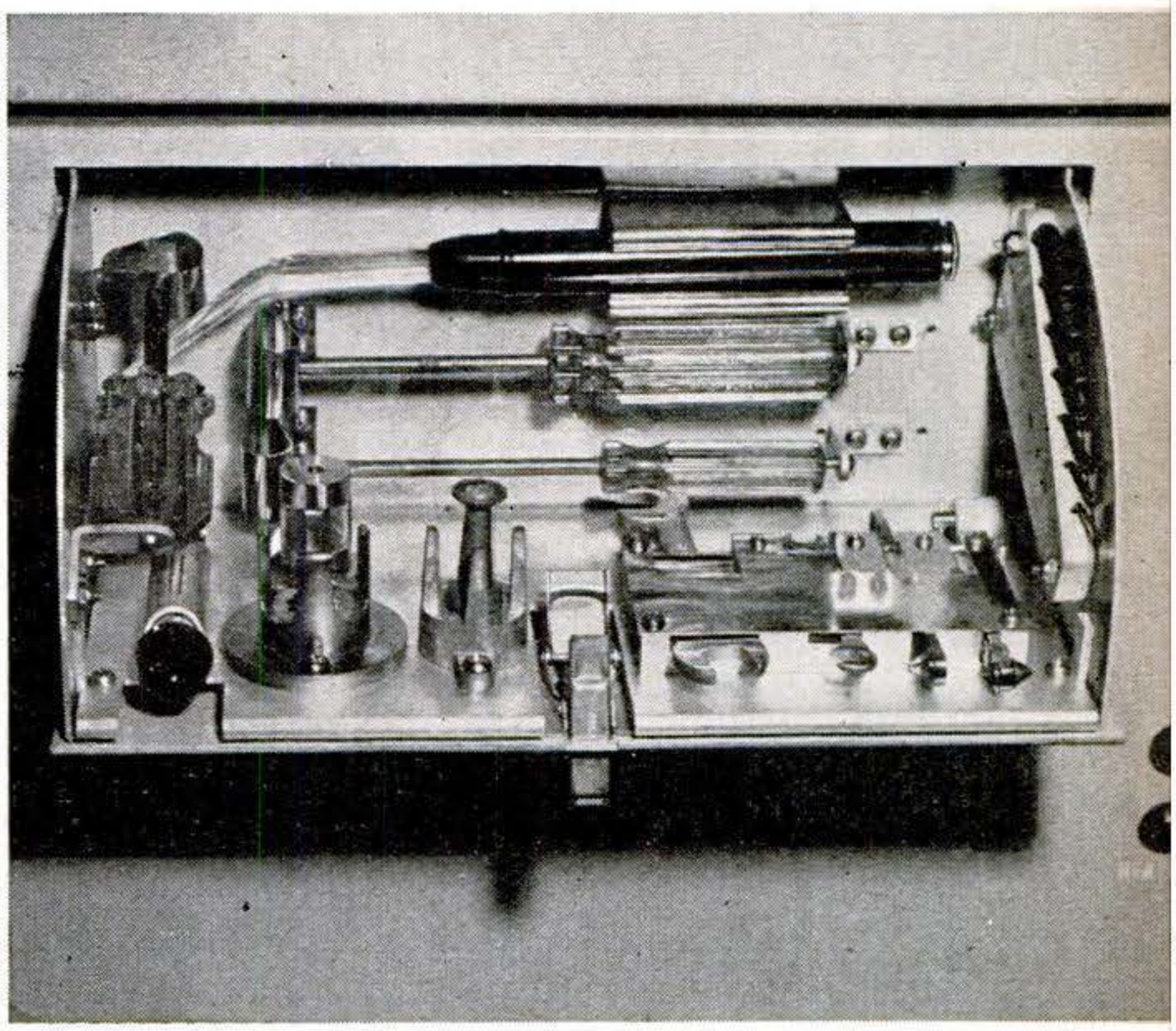
The Bell System already has the equipment installed for this New York-to-Boston chain of relay stations and is working on chains from New York to Philadelphia and Chicago. These relays will be capable of handling television shows as well as phone calls. Western Union now is using a radio relay system developed by the Radio Corporation of America between New York and Philadelphia, will soon send telegrams from Pittsburgh to Washington the same way, and expects every main telegraph route in the country to be a radio relay system within a few years. The General Electric Co. is now transmitting television shows from New York to Schenectady, and the Philco Corporation has a similar link between New York and Philadelphia television stations.

The beams transmitted and received by the relay stations are so narrow that it would be difficult to tap them. This is one of several reasons for using extremely high frequencies (around 4,000 megacycles, several thousand times as high as those of ordinary broadcasting stations). At such frequencies, the energy can be focused into beams so narrow that 100,000,000 times as much of it reaches the receiver as would otherwise. Most microwave transmitters produce only one watt of power, as compared to the 1,000 to 500,000 watts scattered by lower frequency radio stations.

Microwave beams, moreover, are not bothered by sunspots, thunderstorms, man-made electrical interference, hail, sleet, or snow. Since the towers are always on hills, even floods will seldom cause trouble. But the big reason for high-frequency beams is their tremendous carrying capacity. Several hundred people will be able to talk at the same time over Bell System's New York-Boston beams.

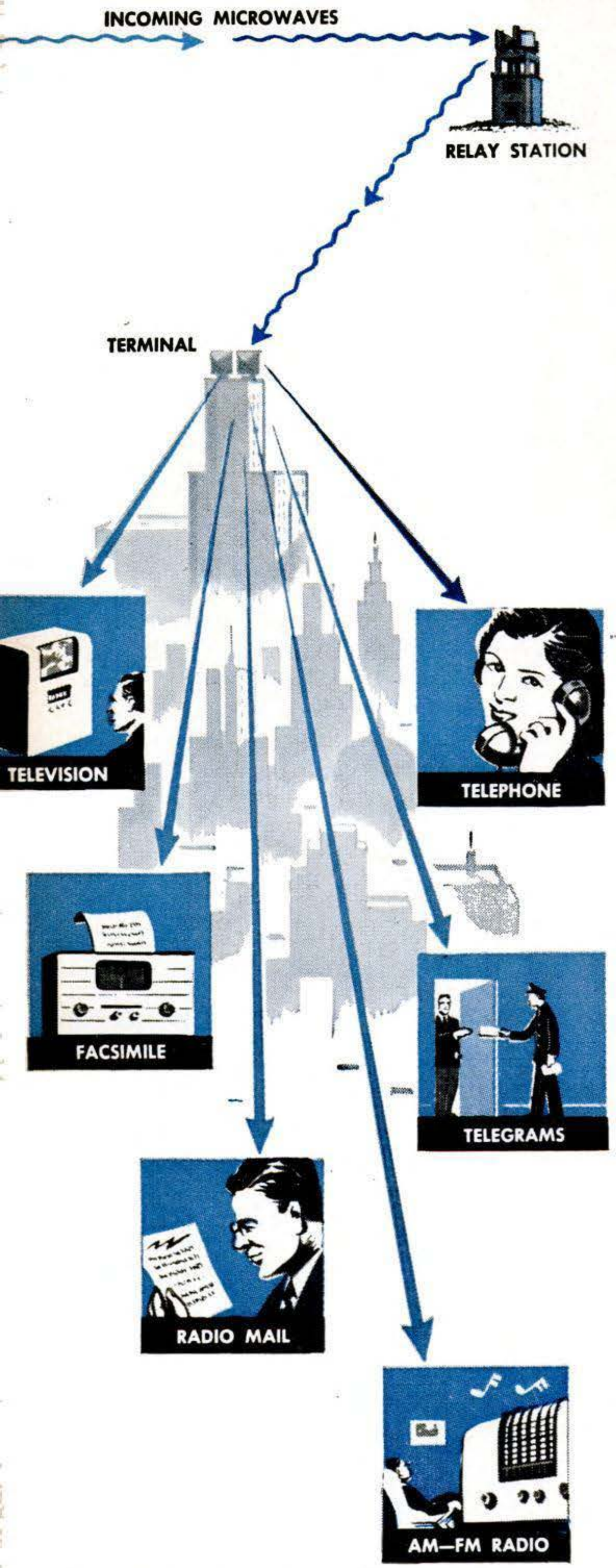
Radio relays, however, are not the only means of increasing the capacity of a communications system. Much further developed than radio relays for telephone service is the coaxial cable, which is basically a copper tube with a wire running down the center. "Coax" already is being used both for telephone and television service. The cable must be buried in a deep ditch, and many amplifiers are needed, but the Bell System's experience with coaxial cable has been so gratifying that more of it is being laid rapidly. By 1950, 12,000 miles of such cable will have been laid to link practically



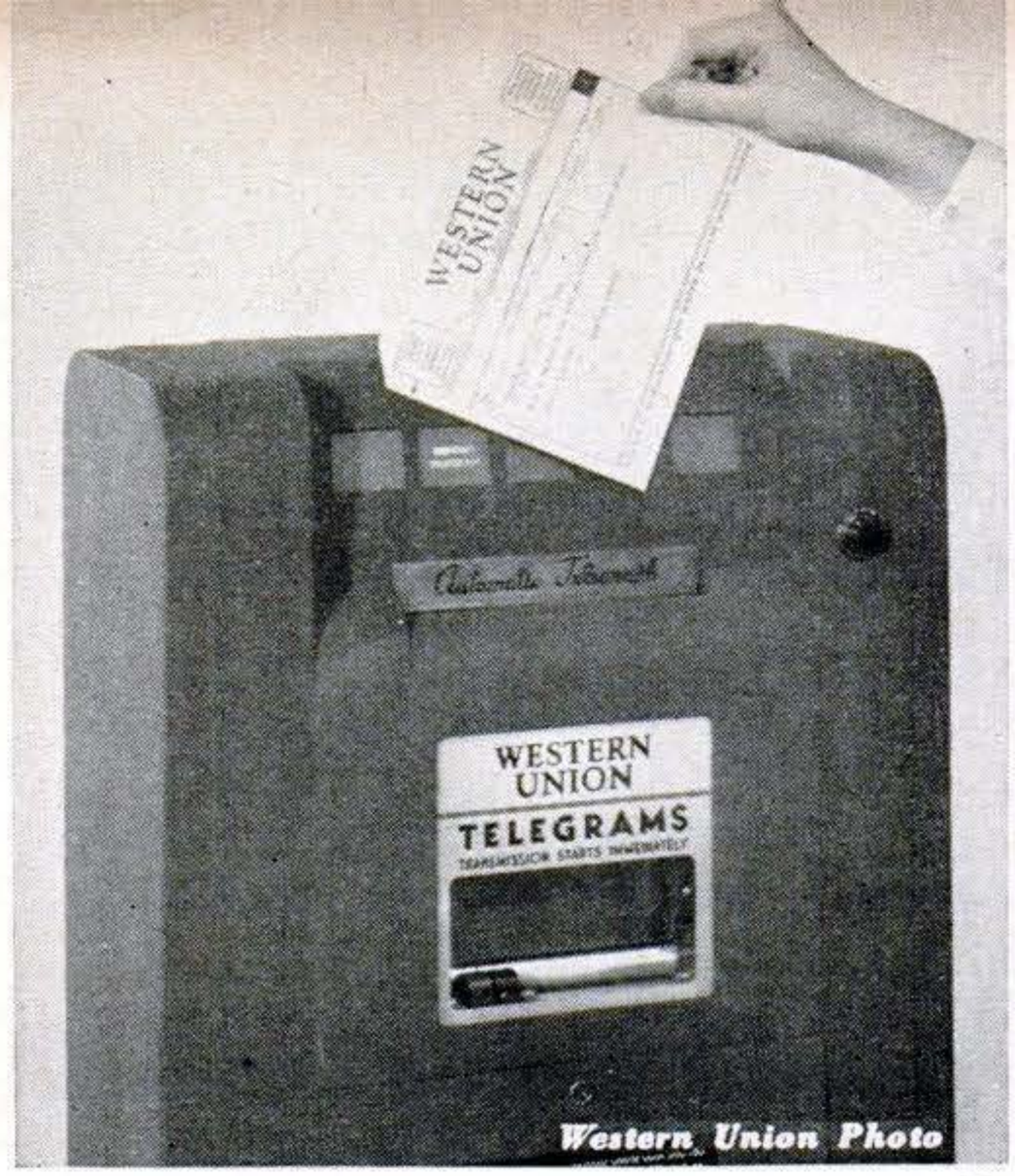


Repairmen can never complain that they forgot a tool—everything needed for maintenance of relay equipment is included in a rack built in each panel (left). In addition to ordinary tools such as screwdrivers and lucite-lensed flashlight (see close-up at right), there are special gadgets like prong-straighteners for the tubes (left of center). Refinements like this help make the relay stations so self-sufficient that little supervision is required.

Copyrighted material



The microwave relays will serve as a trunk-line highway for all kinds of communications, as illustrated in the above drawing. Radio is used only to carry traffic to the city terminal; it is distributed from there to users on wires.



Coin-in-the-slot facsimile machines are already being developed to flash your wires across the country in a fraction of a second. This model (not coin-operated) is now in use to feed messages from hotels and business offices to the big central exchanges of Western Union.

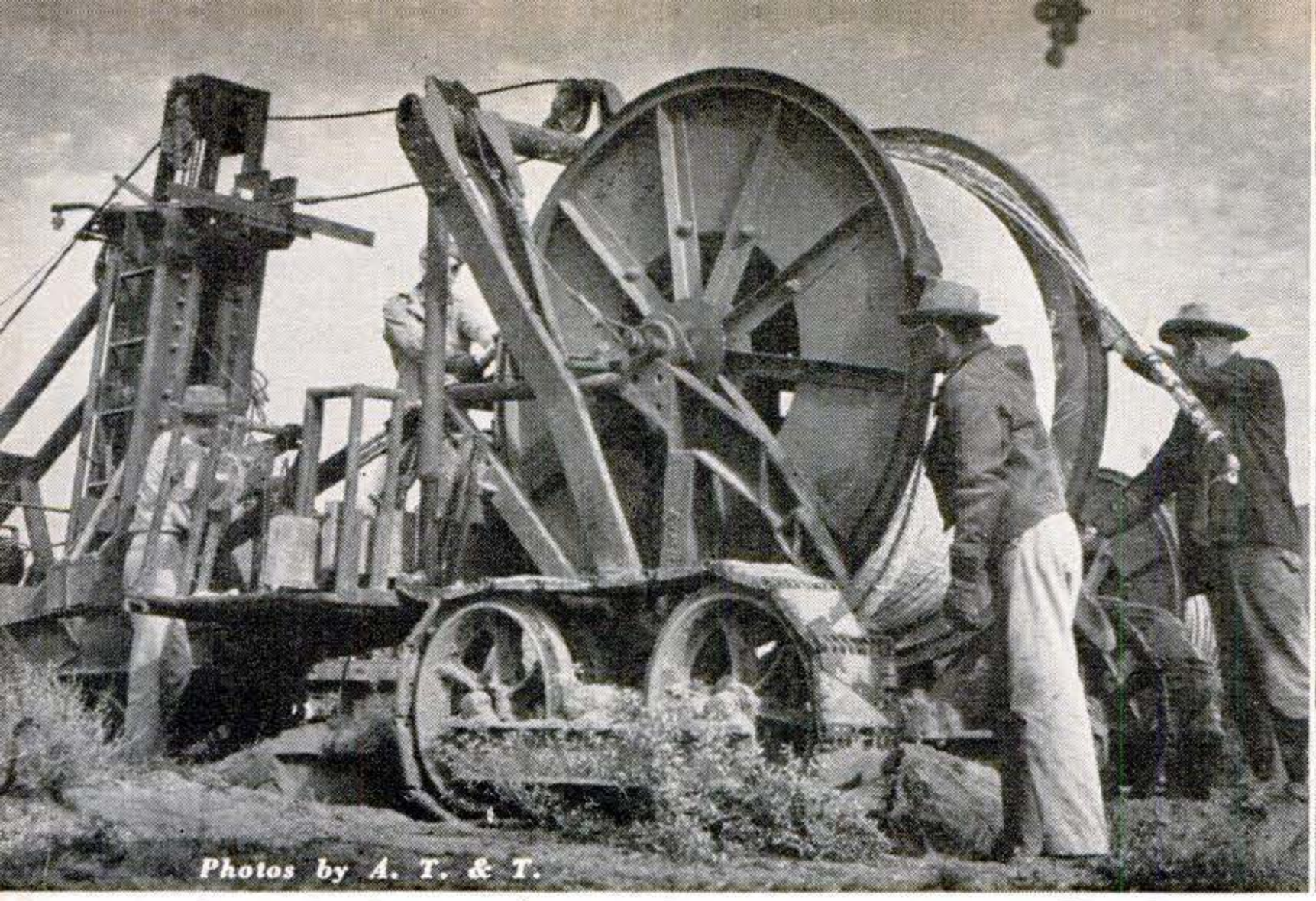
every major city in the United States.

The ability of radio relays and coaxial cables to carry more traffic will solve the major problem of the communications companies: how to handle more business. The wire networks have been called upon to carry an ever-increasing load of phone calls and telegrams. On top of that, there are new kinds of business that will not fit well on the wires—television, FM, and high-speed facsimile. Existing wires will continue to be used for comparatively short-distance phone calls and telegrams, but the burden imposed by the addition of new services will be handled largely by the new systems.

Television is the greediest customer. A television show can be sent over ordinary wires, but many amplifiers are needed and a coast-to-coast hookup by such wires is impractical. Even microwave equipment at present will carry only one television program per channel, because that is all the amplifiers can take. Better amplifiers, like the traveling-wave tube (PSM, Nov. '46, p. 111), are being developed, however, and may increase the capacities of microwave systems.

Already, too, scientists are working on another kind of wire that possesses almost limitless carrying capacity—wave guides, which are just what the name suggests: copper pipes that guide waves. In a wave guide, the radio wave travels in the empty space inside, not in the copper itself. The

Copyrighted material



Coaxial cable can also provide communications networks geared to present-day needs, capable of transmitting television programs, facsimile, FM radio, and many phone calls and telegrams. This machine (left above) lays coaxial cable almost automatically. It digs the ditch, puts cable down, and then fills in the ditch—and even guides itself around obstacles. When one reel of cable is used up, however, handwork becomes necessary. The beginning of the new reel must be spliced to the end of the old one, a painstaking, delicate job (right above).

copper serves only to hold the wave in place. Engineers call the waveguides "plumbing" because they look and work like the water pipes in your home.

Waveguides already are being used in radio relay stations (and radar sets, too). They carry the microwaves the few feet from the receiving antennas to the amplifiers and back to the transmitting antennas. Waveguides promise to be the ideal means of communicating intelligence when present difficulties are ironed out. A single pipe could carry all of the communications between the Atlantic and Pacific coasts. It could take every phone call and telegram now handled by hundreds of wires and still have plenty of room left for television, FM, and facsimile. As a long-distance path for communications, however, waveguides are still in their infancy.

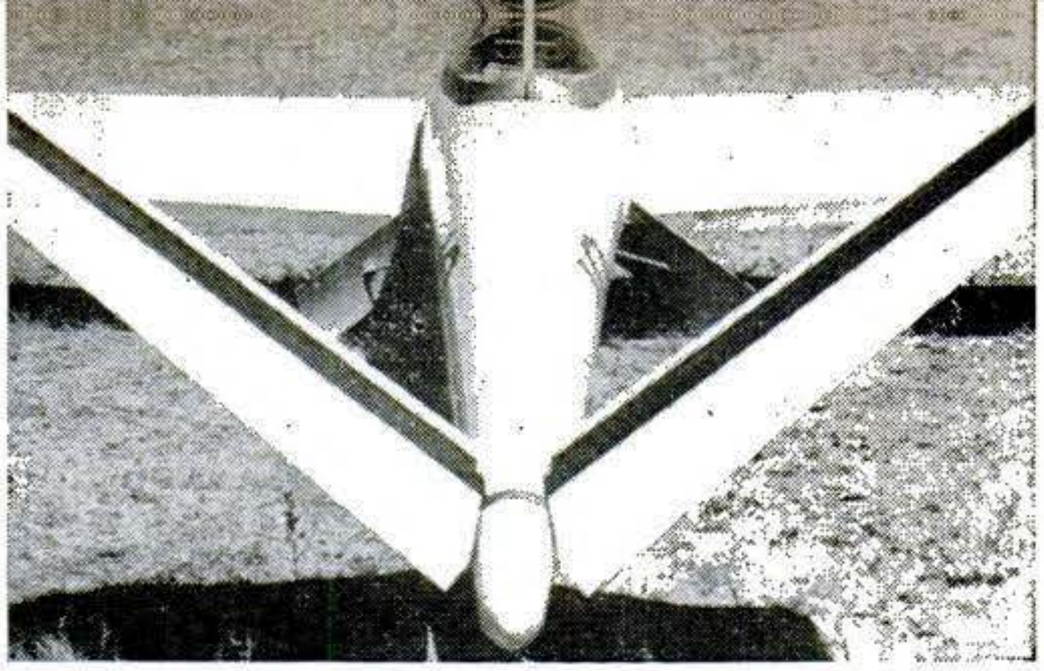
Networks of some kind, capable of delivering television and FM service to every home in the country the way wire networks now carry standard broadcasts, will be available in the very near future. They will also make possible such spectacular services as radio mail, a system of high-speed facsimile which may replace telegrams and air mail by speeding your letters across the continent at the rate of a million words a minute.

Radio mail equipment is being perfected now by RCA and Eastman Kodak under the name of Ultrafax. This equipment will combine photography and television to flash any kind of written material over a great distance almost instantaneously. Letters, books, newspapers or what have you will be first photographed on motion picture film. The film then will pass before the lens of a special television camera that will convert it to a radio wave and send it over a microwave relay or a coaxial cable to a distant receiver. There an electron beam will "write out" the material on unexposed film. After fast processing, this film will reproduce the original.

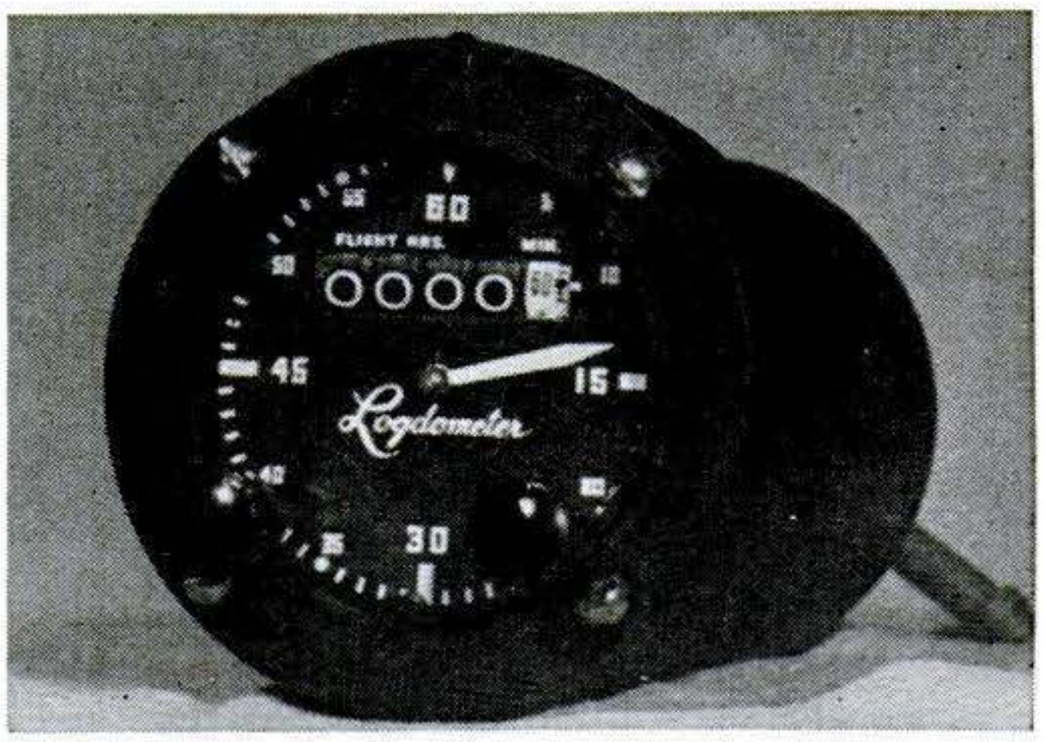
David Sarnoff, RCA president, says Ultrafax will be capable of sending 40 tons of air mail from coast to coast in a single day. Besides letters, Ultrafax will be able to send newspapers over the air, perhaps even in the middle of regular television broadcasts. E. K. Jett, of the Federal Communications Commission, suggests that Ultrafax might be used to transmit a whole issue of the *New York Times* from New York to San Francisco during the few seconds between programs. The screen on a home television receiver would darken while the announcer said, "This is WNBT, New York," and in that instant the picture frequencies would be used to send the whole newspaper. With the help of modern, high-speed methods of reproduction at the receiving end, San Franciscans could get their copies of the *Times* as soon as New Yorkers! END

Copyrighted material

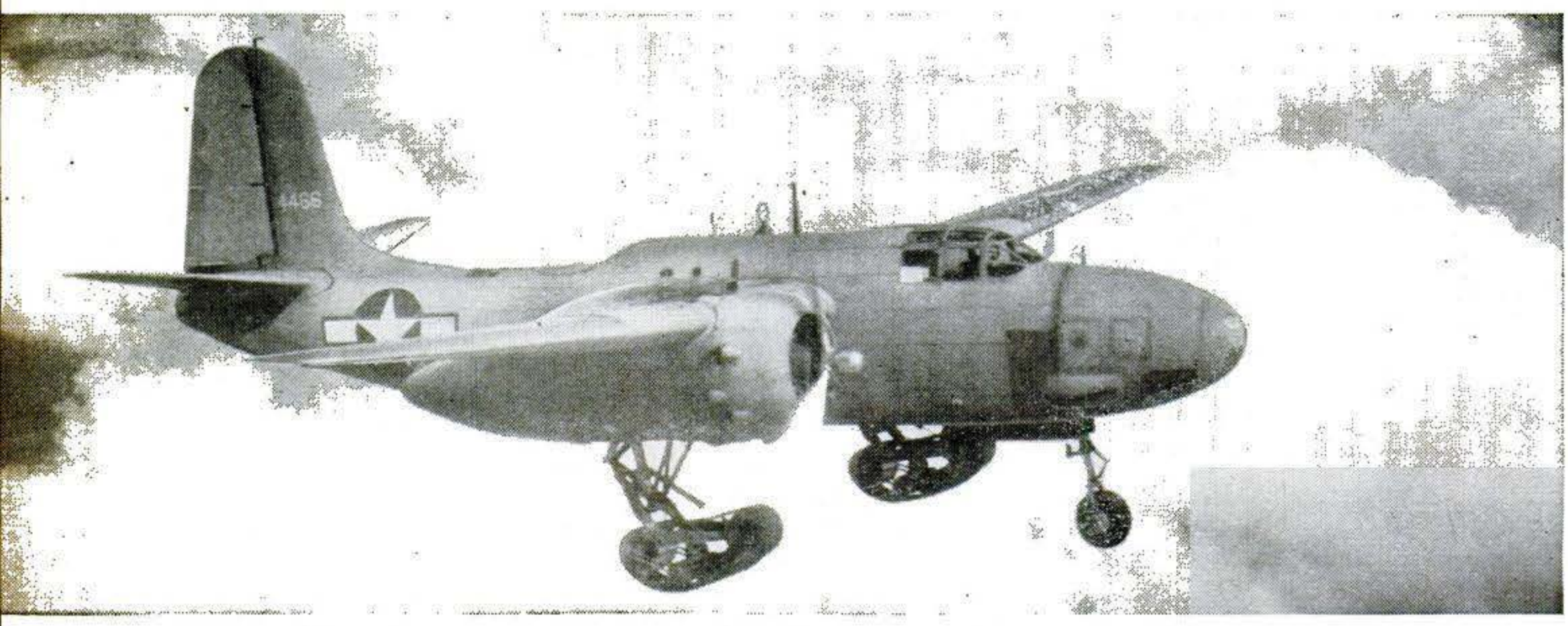
Tower Tests Rotors. This 40-foot cone at Langley Field, Va., is the NACA's device for testing performance of helicopter rotors without bothering to send them aloft. Instruments in the tower measure thrust and side forces, blade pitch, wind, engine r.p.m., and many other factors, while oscillographs record all data for analysis.



Sailplane Shuns Bulk. Said to be the smallest and lightest sailplane in the world, the V-tailed craft above is only 16 feet long, has a 36-foot wing, and weighs 185 lb. Built by Irving Prue, Lockheed engineer, it is made almost entirely of magnesium shaped by heating in an ordinary kitchen stove. Projections at side of fuselage are air brakes.

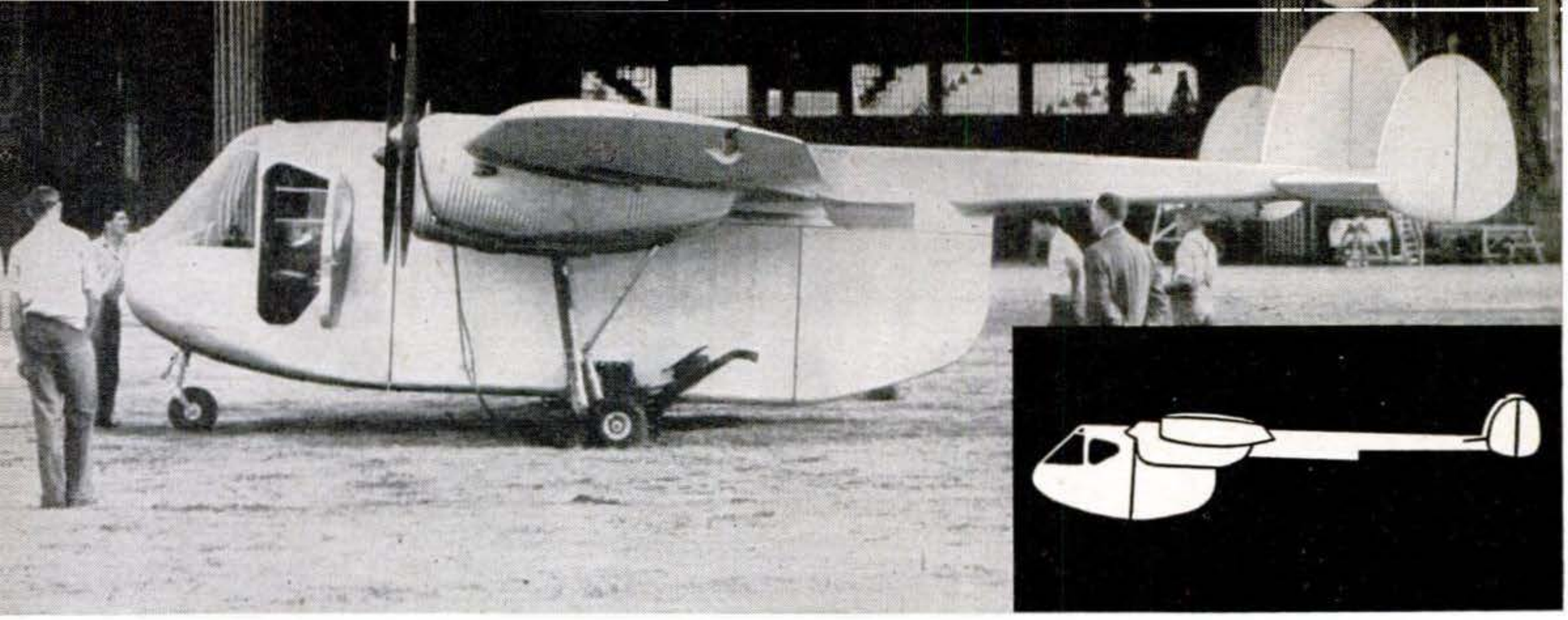


A Timer Runs Itself. Spring-driven and actuated by airspeed, the Logdometer automatically records a plane's time aloft, can be set to clock flight check points.



Trying Out Tractor Gear. An Air Force guinea pig, this A-20 has been fitted with the tractor landing gear under development for heavyweight planes. In one test, the plane ran over an eight-inch-square timber at 90 m.p.h. without damage.

Copyrighted material



Trailer Grows Wings. For transport to and from airports, the Miles M-68's freight compartment turns into a trailer. The center of the fuselage is detachable (the four-engine British carrier flies with or without it) and has removable wheels and a towing bar. The plane is shown above with its freight container in place; silhouette shows rear of fuselage moved up to complete the cabin with the container left out.

Transatlantic Air Liner. France's six-engine Latecoere 631, destined for the South Atlantic run, has a wing span of 188 feet, a cruising speed of 185 m.p.h., and carries 46 passengers on long-range flights. Ten of the flying boats are being built.

Four-Jet Fighter. For flying and for fighting blind in any weather, even in the Arctic, the Air Force now has the big Curtiss XP-87, its first four-jet fighter. Sixty-five feet long, with a span of 60 feet, it may do better than 600 m.p.h.

Copyrighted material

Boys Build A Cyclotron

This little atom smasher, designed by California high school students, works just like the big ones.

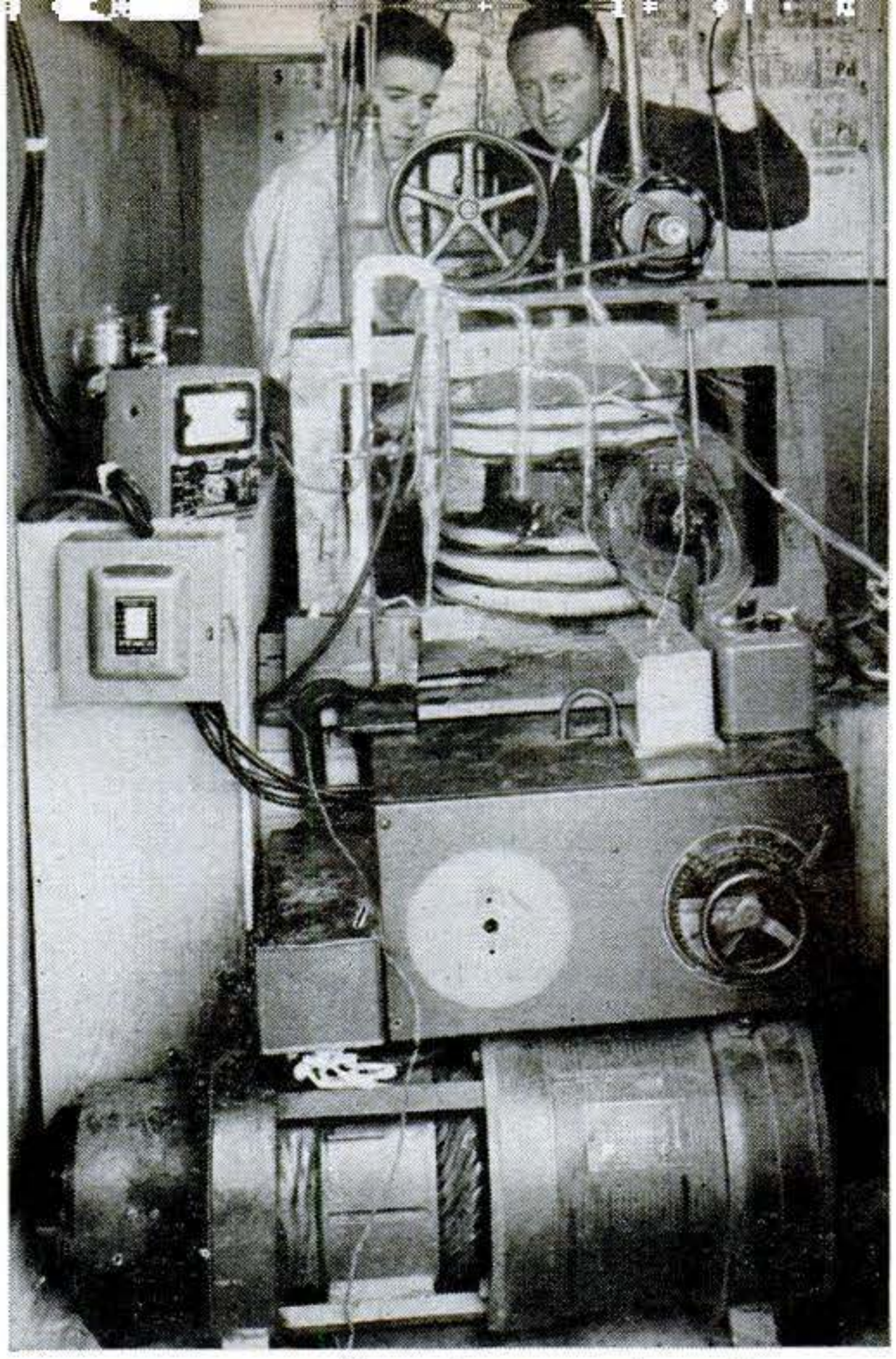
By Andrew R. Boone

THE young nuclear physicist who won the Nobel prize by developing the cyclotron, Ernest O. Lawrence, started out with a little glass device that looked like a frying pan. Since then, cyclotrons have become such mammoth, complex, and expensive machines that the patent holders are rarely bothered by requests for licenses to build them. But ingenious and industrious youngsters can still build cyclotrons.

This was proved recently at the El Cerrito, California, High School, where four students of instructor Ben Siegel built their own cyclotron, put it in a room scarcely any larger than a clothes closet, and operated it by remote control from a homemade, plywood instrument panel.

They neither asked nor received any help from the Atomic Energy Commission. They found, when they had completed it, that they probably had infringed on patents granted to Dr. Lawrence and assigned by him to the Research Corporation of New York, but officials of the latter waived royalty claims. So the students now are planning to use their machine to produce their own radioactive isotopes for further experiments. They plan to shield near-by workers with tanks of water three feet thick.

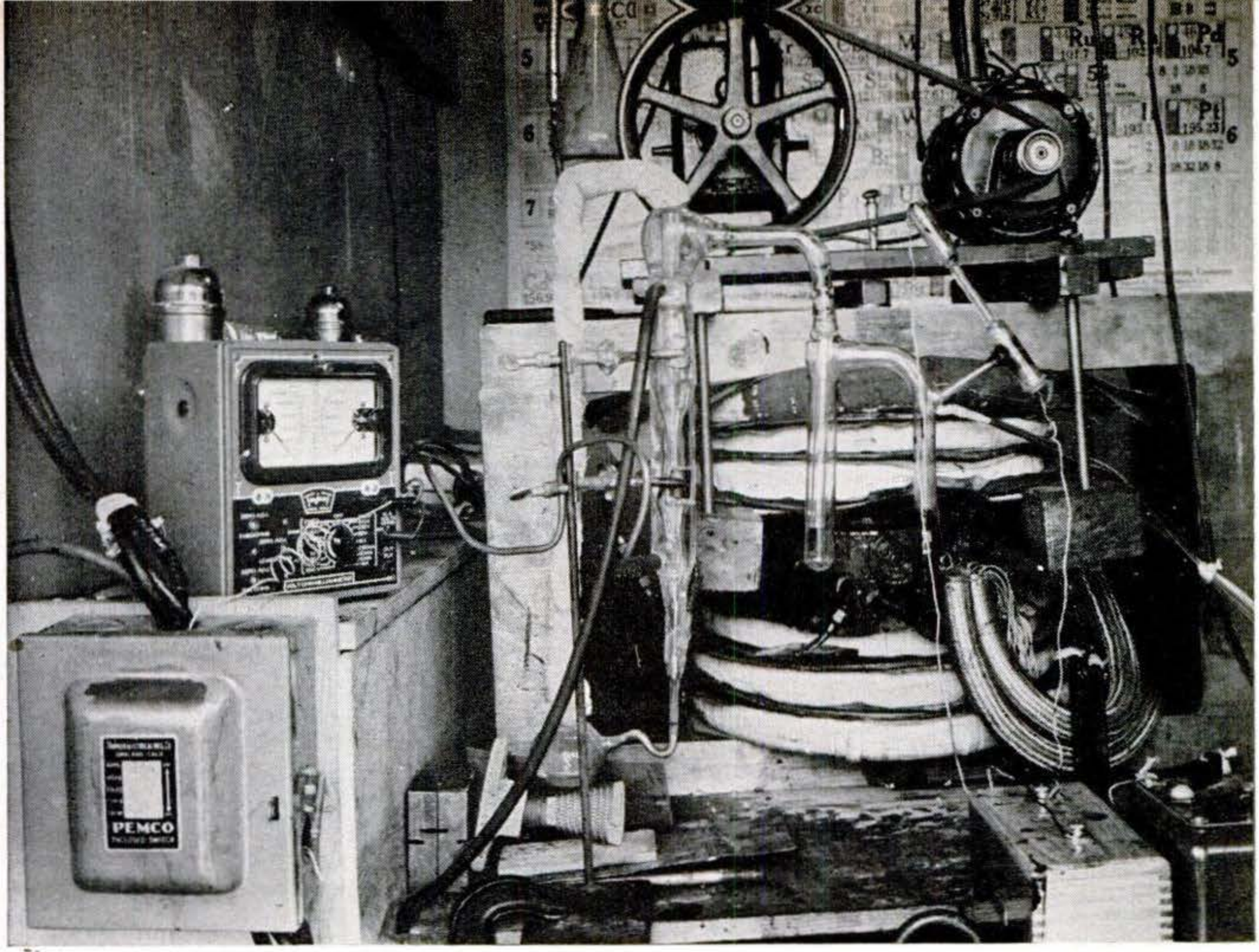
A cyclotron is a machine for speeding up subatomic particles by giving them a series of relatively weak electrical pushes while they whirl around in ever-widening circles. This is done by placing the acceleration chamber between the poles of a magnet and maintaining a high vacuum within the chamber to prevent air from retarding the tiny particles. When finally allowed to fly out of their circular path, the particles have



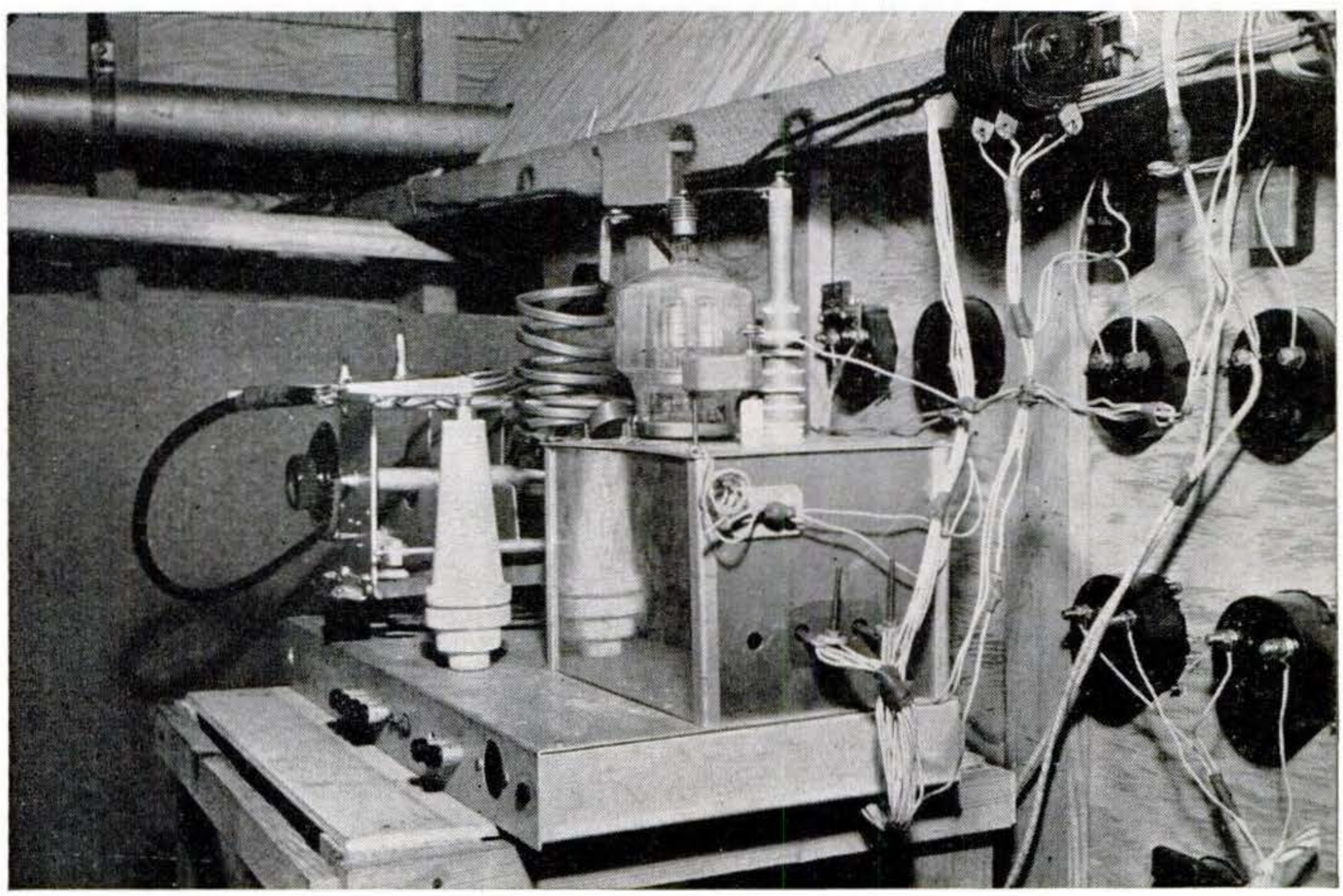
This one-ton, million-electron-volt cyclotron is five feet high and 2½ feet square. It was built by four boys and their teacher in three months at a cash outlay of only $500.

The instrument panel, 3½ by 7½ feet, was built in sections to make servicing easier. Most of the instruments used were built by the boys or revamped from Army surplus items.

Copyrighted material



Motor and pump on top are used to start a vacuum in the accelerating chamber. The pronged glass tubing in front is a mercury diffusion pump, which completes the job of creating the vacuum. Those things that look like pancakes are the coils around the poles of the magnet. The acceleration chamber is located between these two sets of coils.



Power transmitter shown here is located in a room above the cyclotron, and its output is delivered by a variable link coupling and shielded coaxial cable. Transmitter operates on 2,000 volts at one ampere, and puts out 1,500 watts of power on a 20-megacycle frequency. The system is designed to handle a larger, heavy-duty chamber the boys are planning.

Copyrighted material

To place a target in the path of the speeding particles, the operators will use tongs and an opening only ½-inch in diameter near the inlet of the U-shaped coaxial cables.

When radioactive isotopes are produced, they will be removed from the cyclotron and placed in a cup as shown above, to be wrapped in foil. Gloves will be worn to prevent injury.

so much energy that they can be used as bullets against the atoms of whatever substance has been chosen as a target.

Building such an atom-smasher, however, is much more of a trick than describing one. The El Cerrito boys had seen Dr. Lawrence's big cyclotron, and knew what it did, but they started to build one without any detailed plans for the many intricate parts that constitute such a machine. "We knew," Siegel told *Popular Science Monthly,* "we'd need a magnet, an acceleration chamber, and a high vacuum." Under his direction, they studied all the literature available, worked day and night, telephoned to friends for advice when they were stuck, and built their baby cyclotron in a record time of only three months.

El Cerrito's shops could not handle the big piece of soft steel chosen for the magnet, so they went to the Oakland Central Trade School for help. There the chunks were ground down and welded into a double yoke weighing half a ton. Winding the coils was the toughest part of the El Cerrito boys' work. For a week, they stood at a lathe, winding five miles of 13-gauge wire manually, counting each turn aloud until 6,000 turns had been made. As a result of their painstaking care, the magnet now will lift a two-ton anvil.

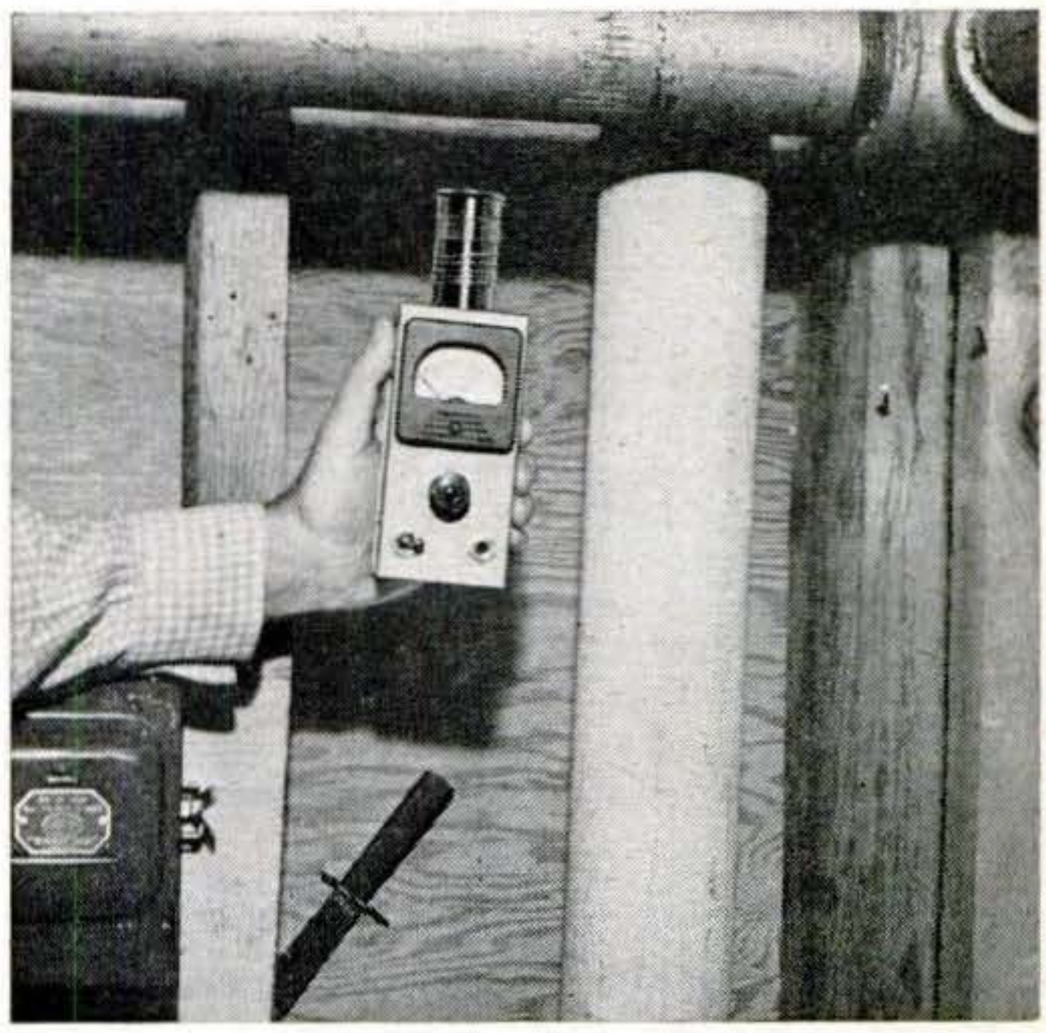
To create the necessary vacuum within the acceleration chamber, they use two

Copyrighted material

Proton "bullets," nuclei of hydrogen atoms, are produced in this generator, which breaks water down into its two components. The hydrogen is passed through an electrically heated palladium valve, at the top of the tube at the left, and delivered to the cyclotron chamber. There electrons are knocked off, leaving the proton nuclei to bombard the target.

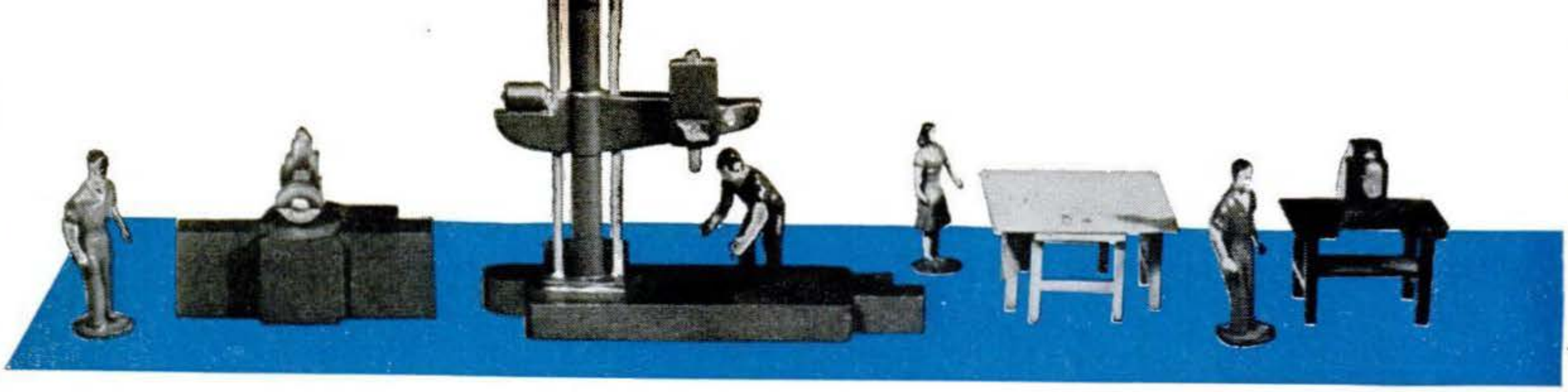
pumps. The first, or "roughing," pump is an ordinary mechanical pump driven by a quarter-horsepower electric motor. The second, which takes over when the first one has completed its work, is an intricate, mercury diffusion pump, built with the help of an expert glass blower at the University of California. Many different combinations of sealers were tried before a way was found to prevent air from leaking in, but Siegel now believes that the apparatus can produce a vacuum equivalent to only a very minute fraction of an atmosphere.

The electrical circuits were also troublesome. They had to be redesigned repeatedly before they functioned properly. Everything in the power system was built oversize purposely, however, because the students hope to build a larger cyclotron chamber later for bigger atom-smashing experiments—and the electrical system they now have will be adequate for their next, bigger cyclotron. END

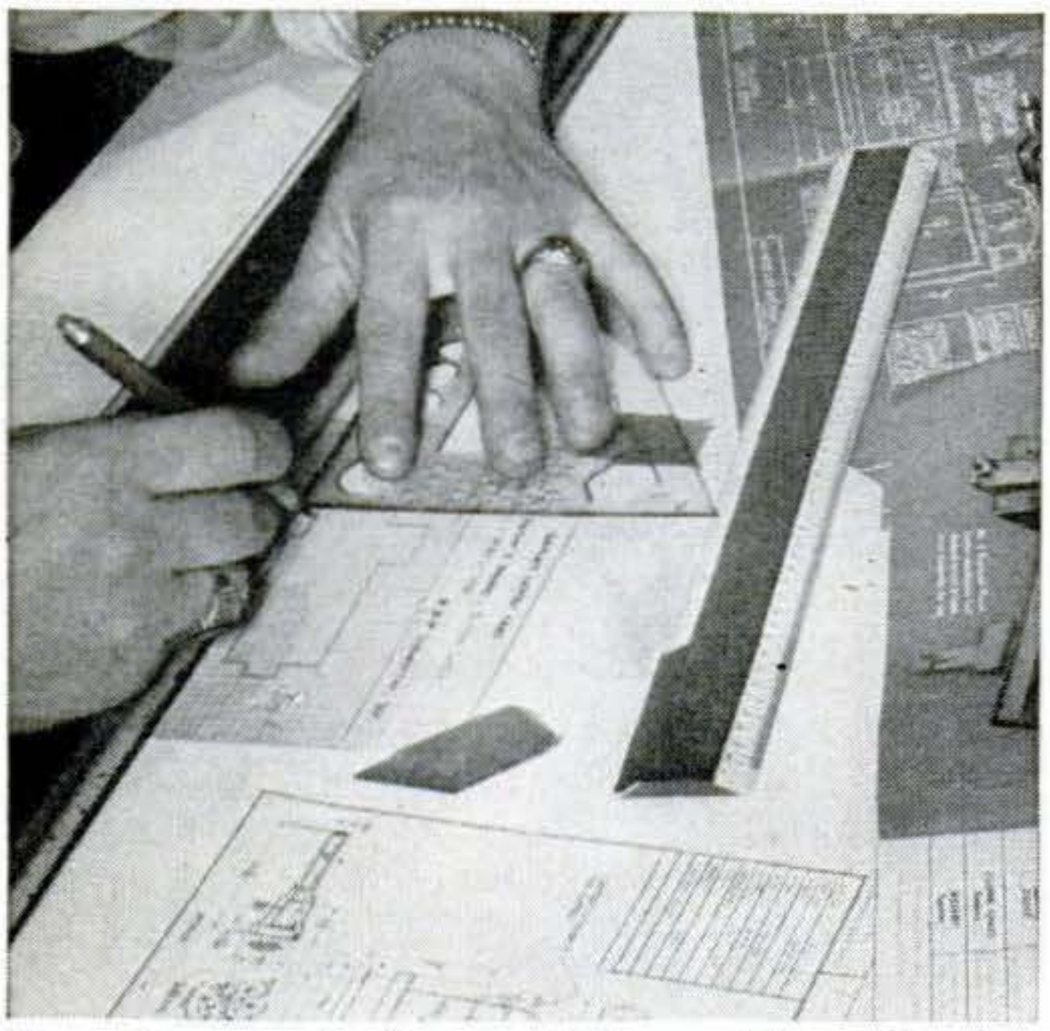


Wave meter shown above is used to detect possible radio-frequency radiations along pipe lines in the school building. Great care also is taken to prevent any leakages that might interfere with neighborhood radios and bring federal authorities down on the operation.

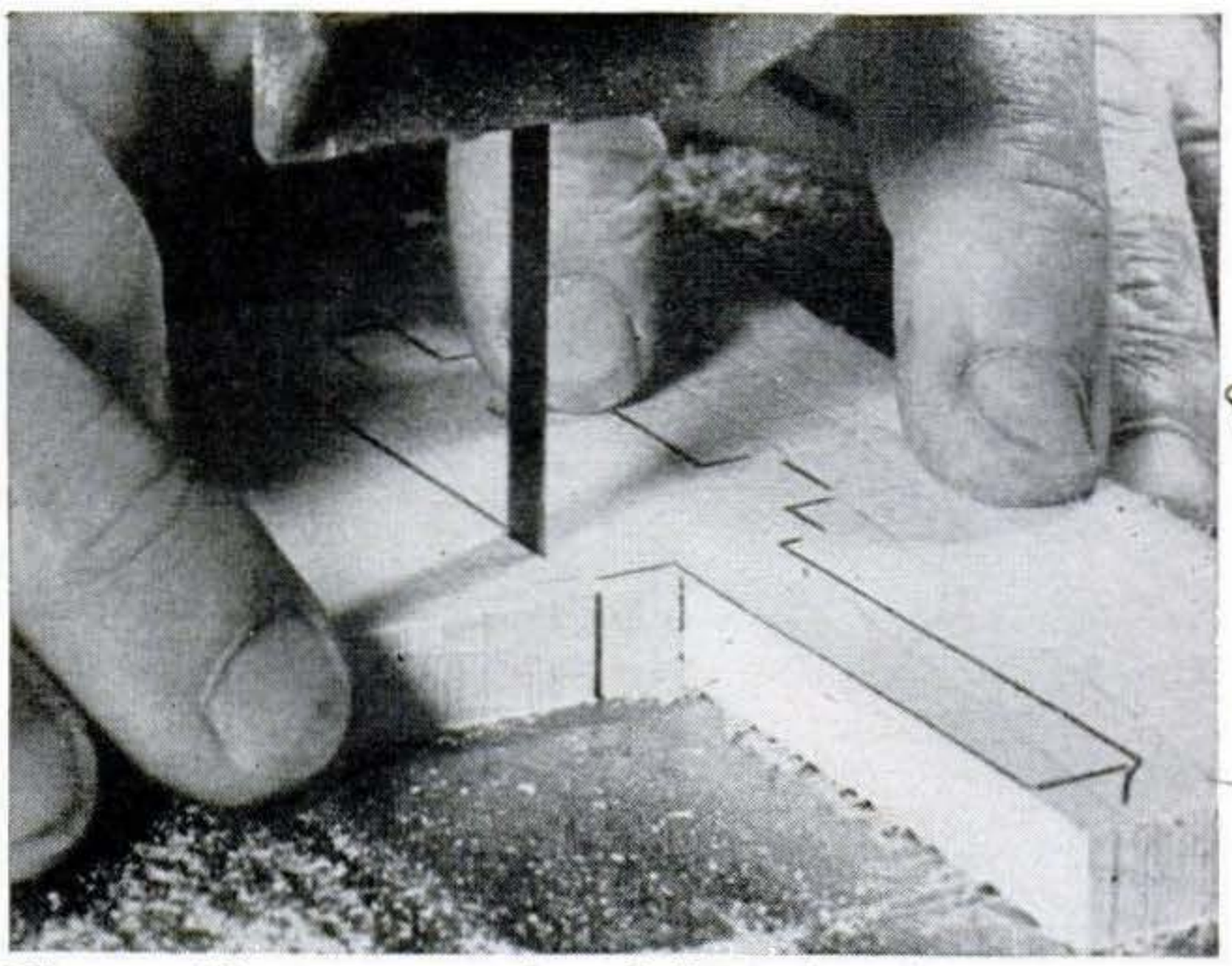
Copyrighted material



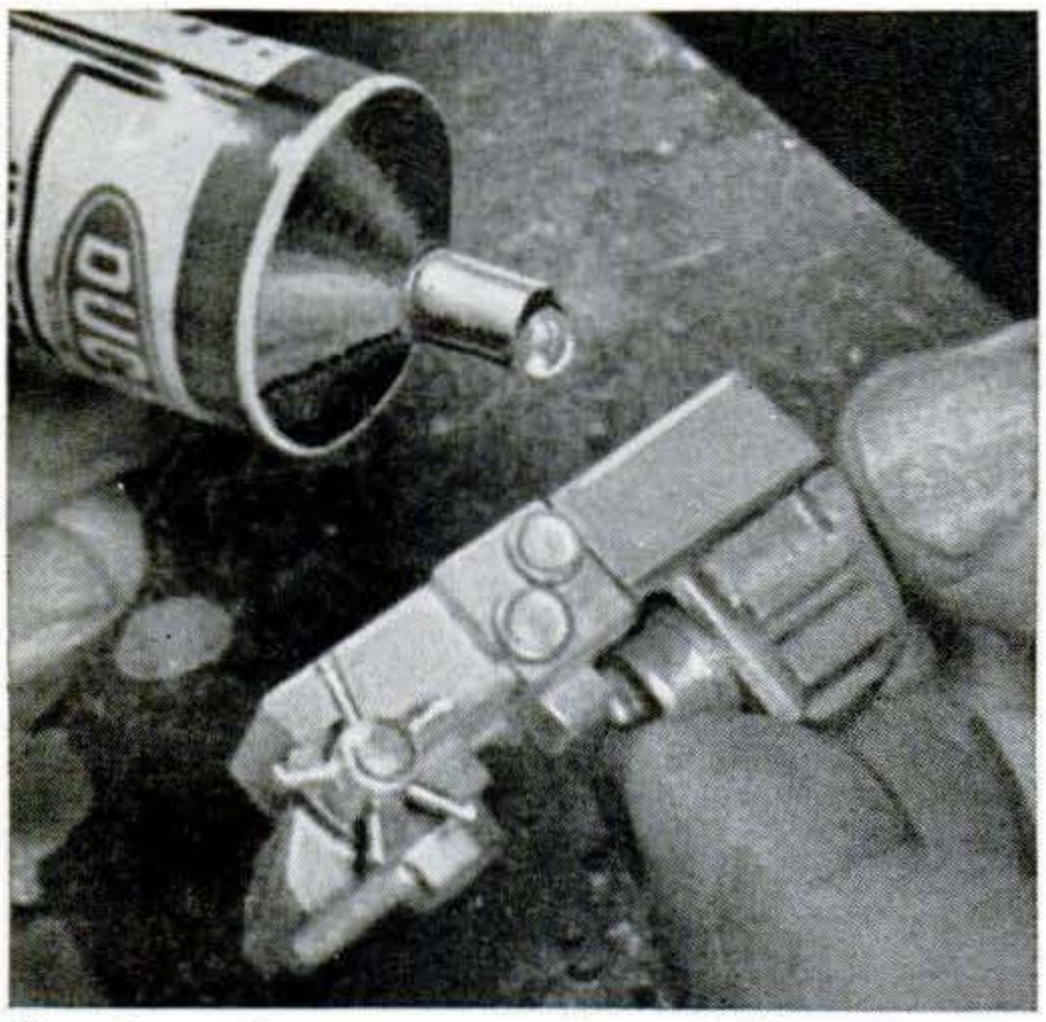
Big Factories Start Small



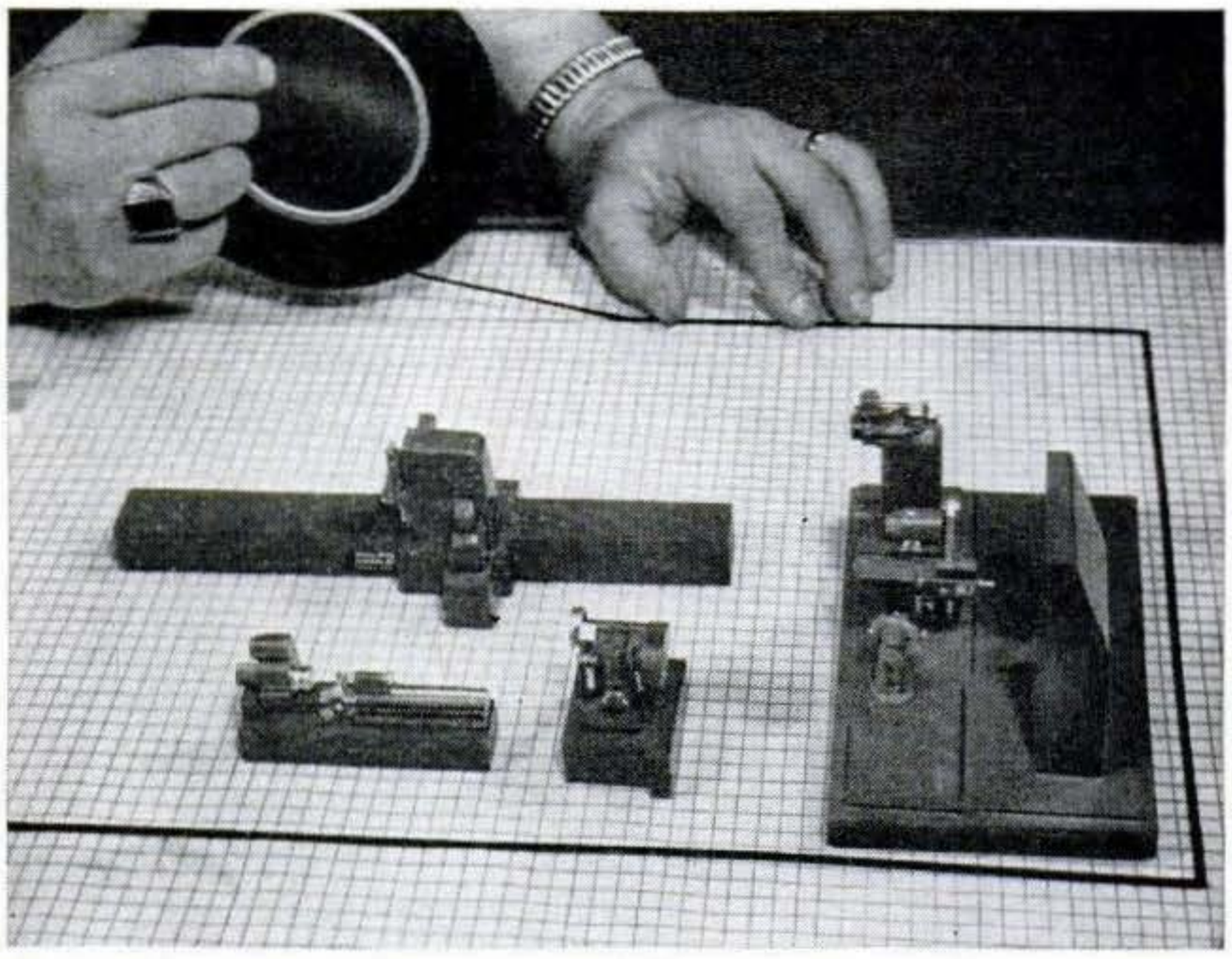
Template cards, from which wood bases for the models are cut, are first made from actual blueprints of the machines they are to represent.



The wood bases, accurately scaled ¼ inch to the foot, determine models' size and shape, are their most important part. They are cut on band saws.



Simple, stylized models of standard machinery, like this miniature turret lathe, are then mounted on the wood bases to identify them.

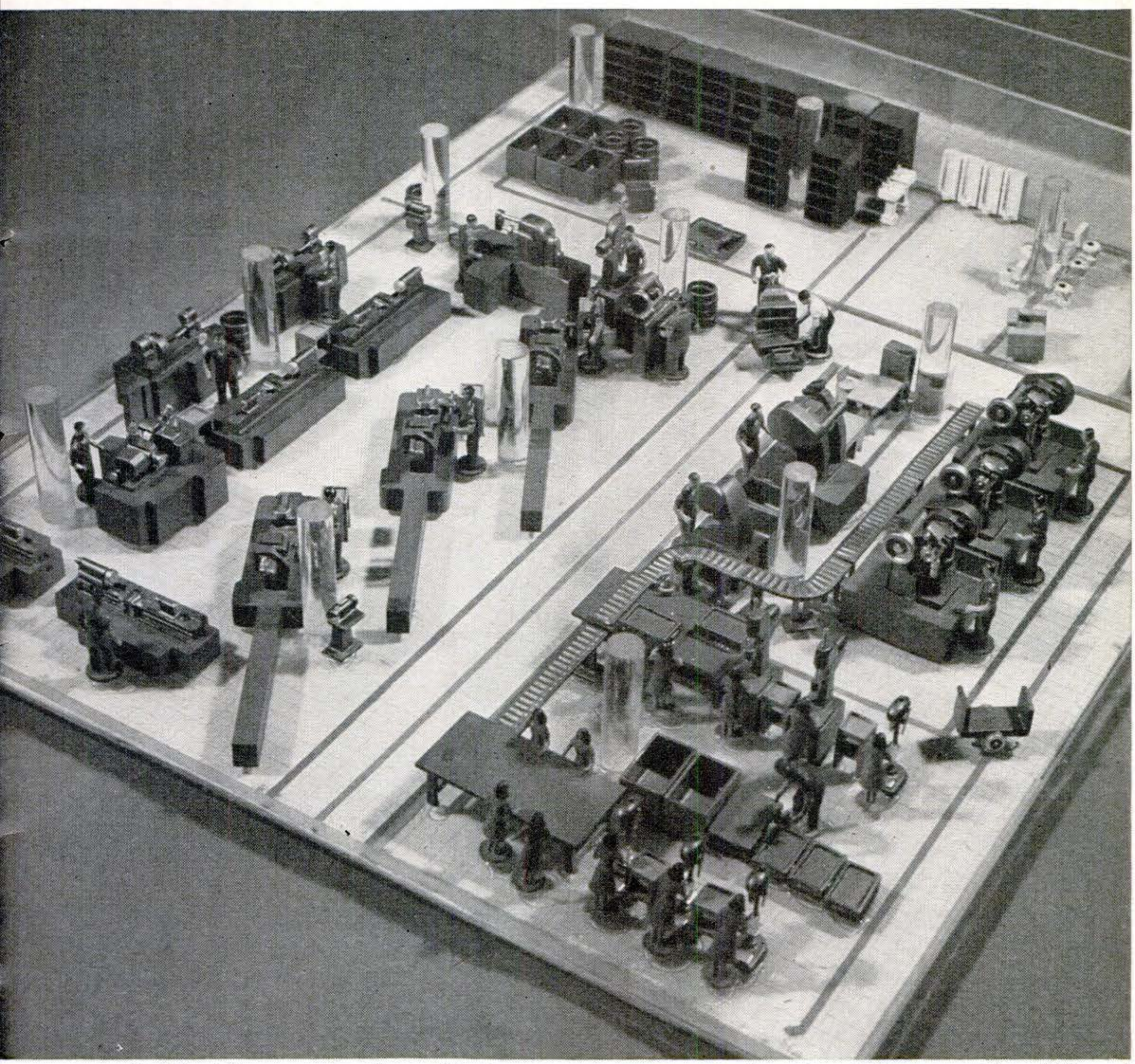


Shop plan takes shape as models are cemented in place on scaled sheets of Lucite. Different-colored tapes mark walls, pipes, and wiring.

Copyrighted material

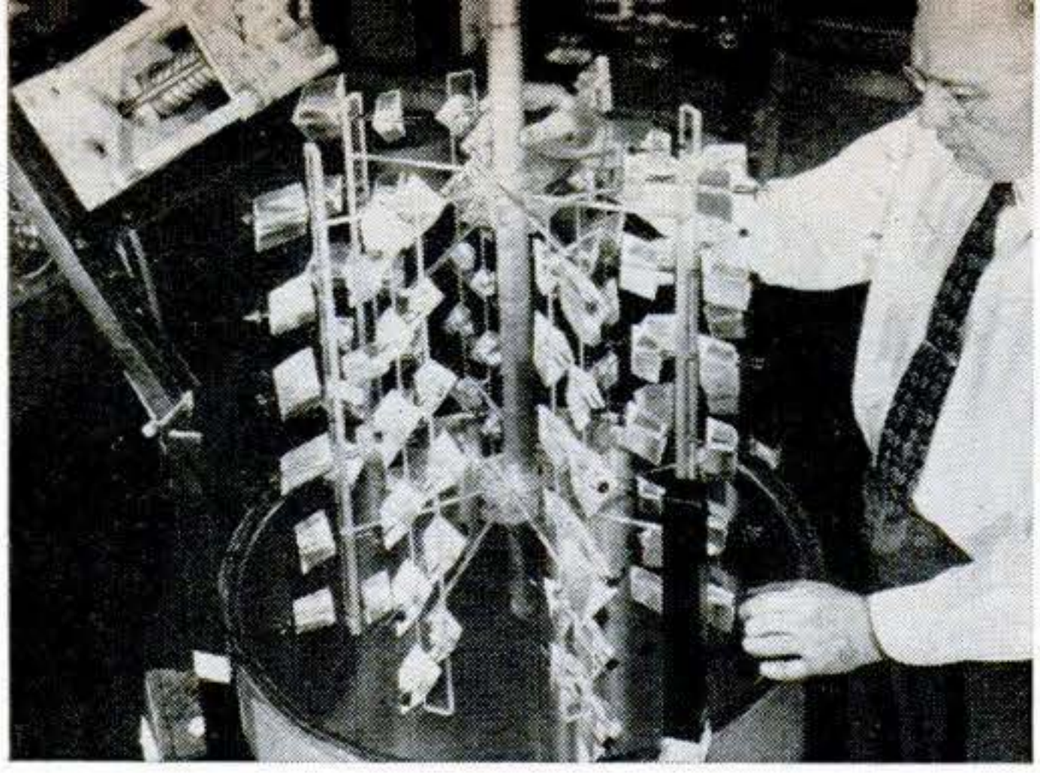
WANT to build a factory? With these tiny models of machinery, you can set it up, change it around until perfect, and then translate the layout into floor plans—all at a fraction of the cost of ordinary, drawing-board planning methods.

By combining stock parts with custom-tailored bases, the models are both accurate and inexpensive. Made by Visual Production Planning, Inc., they are mounted on rubber stamps. Floor plans are made by inking each piece and stamping it in position.



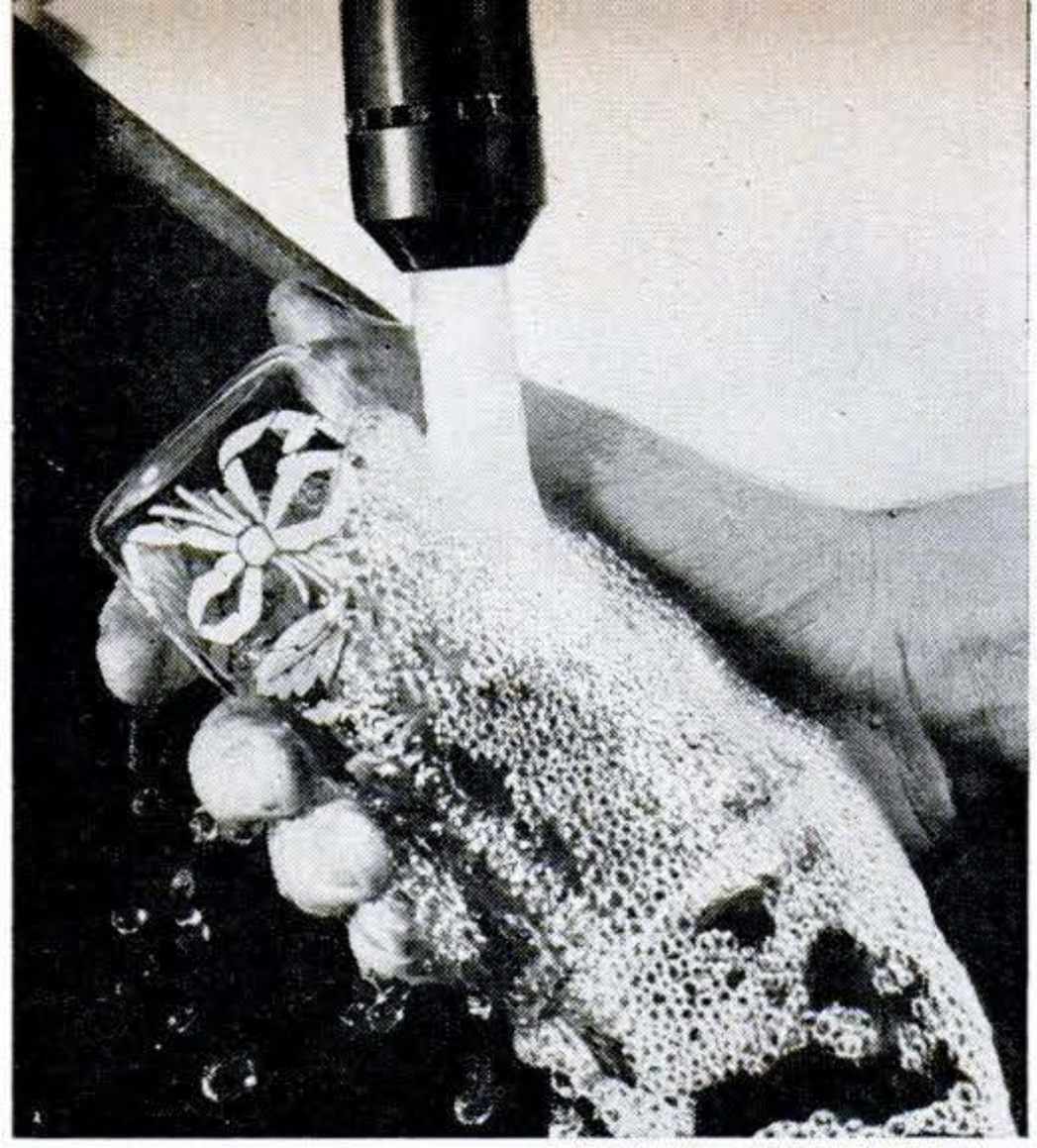
Finished factory, complete with tiny conveyer belt and workers, shows exact arrangement of machinery, rooms, walls, and aisles. At left are turret and engine lathes; at right, drill and punch presses. At top are stock room and lavatories. Lucite posts represent columns.

Copyrighted material



Chemicals Grow Crystals

RESEMBLING a cluster of ice cubes, these are really seeds for telephone crystals. When lowered into a supersaturated solution of EDT—ethylene diamine tartrate—they will grow a crop of synthetic crystals. Developed by Bell engineers, these will replace natural but hard-to-get quartz in long-distance telephone circuits. In a similar project, the Naval Research Laboratories in Washington, D. C., are growing real quartz crystals.

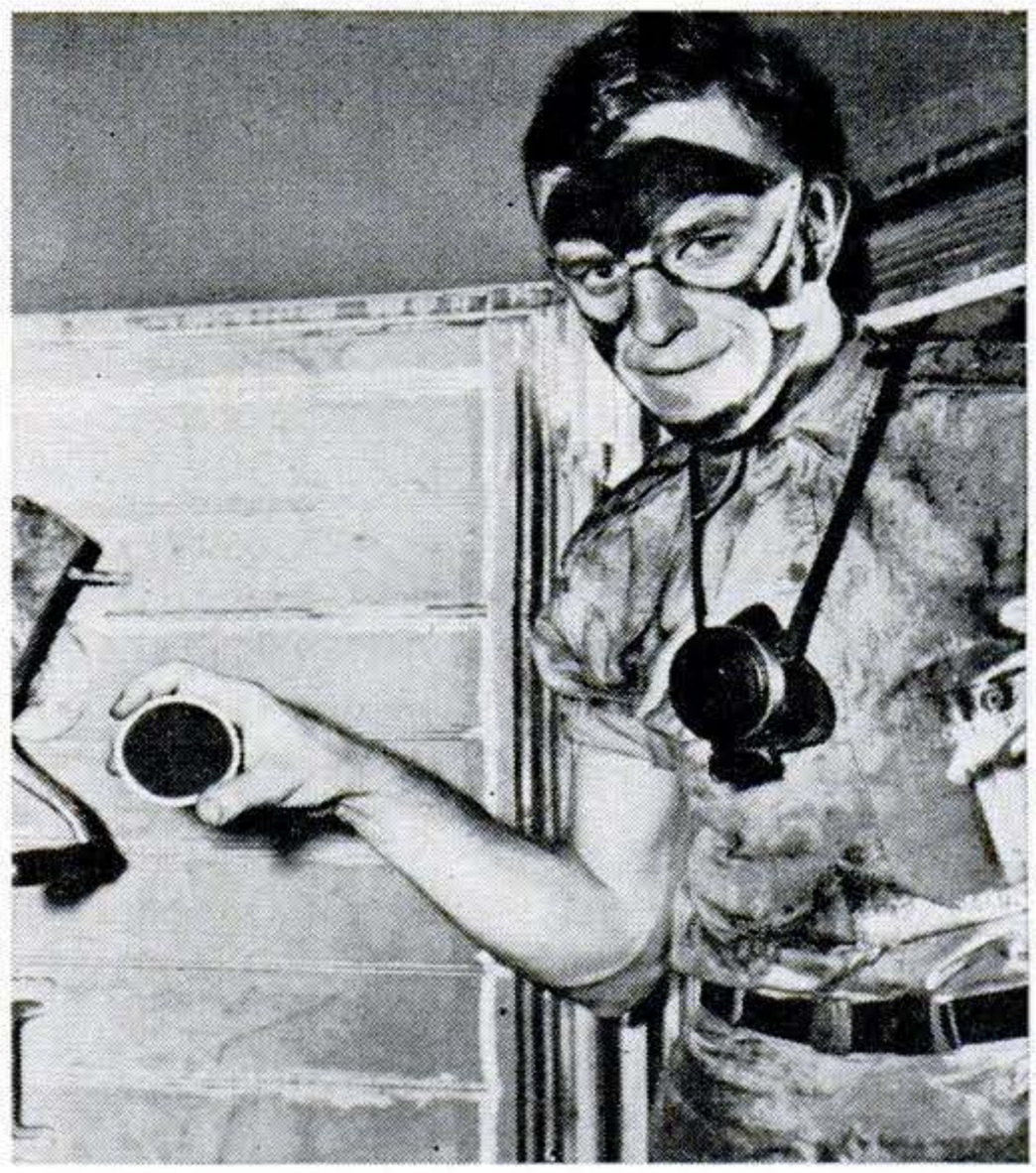


The Splash Is Gone

AS TAP water passes through this faucet attachment, it is permeated by millions of air bubbles. The result is crystal-clear water that is splashless, softer, and better tasting. Called the Velva-Flo, the device is made by Firestone Industrial Products Co.

Mirror Detects Flaws

TRACKWALKERS of the Southern Pacific Railroad take no chances on missing any weaknesses in the rails they inspect. The device shown here has a mirror set at an angle at one end, enabling them to inspect the far side of the rails they patrol. Known as the Sands Rail Inspector, it is used in addition to periodic test by detector cars.

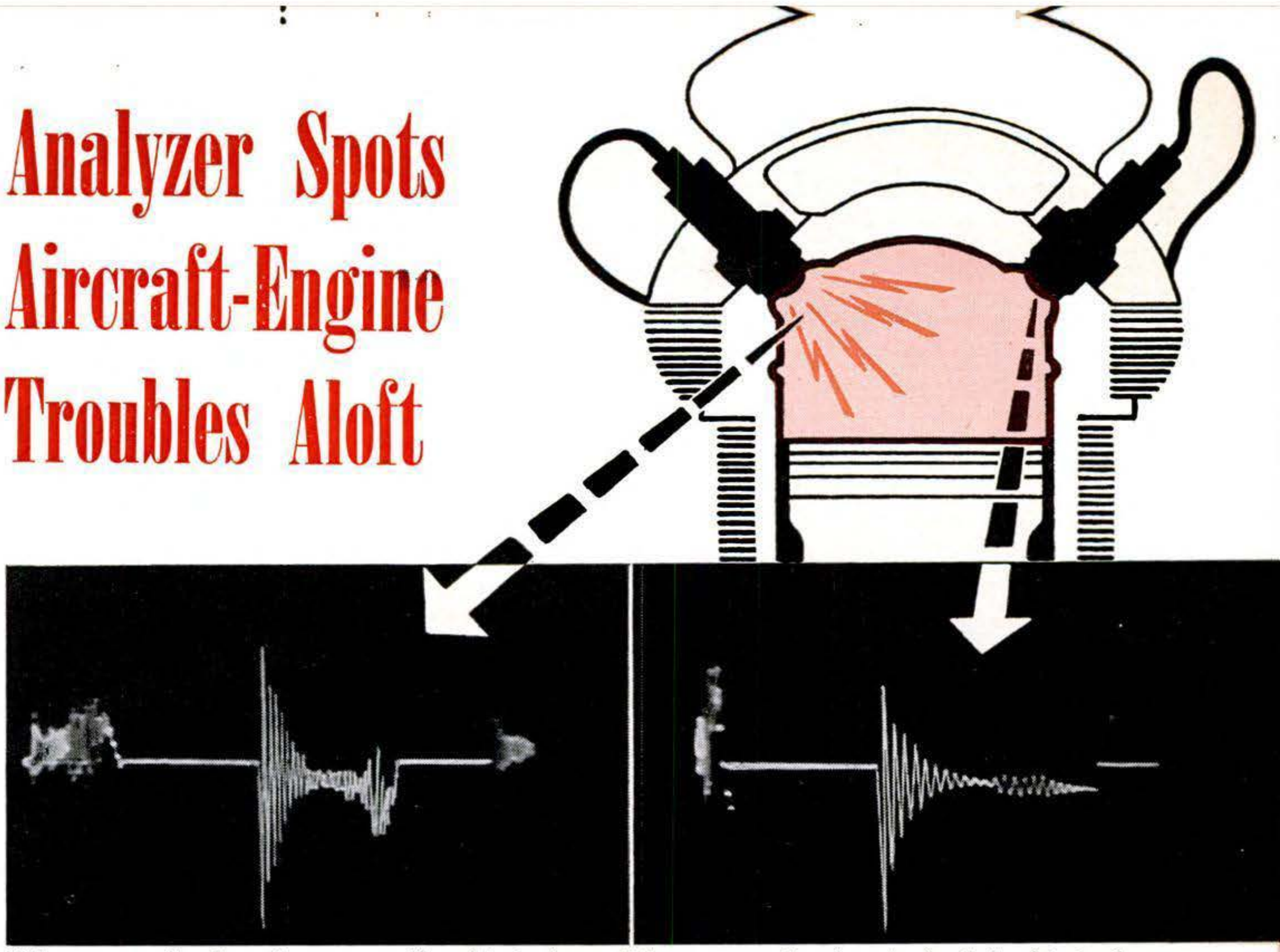


Dust Can't Penetrate

CLEAN areas of this subject's face testify that even carbon black does not penetrate the filter of the American Optical Company's new respirator. Chemical treatment of its fibers makes this filter 40 times more efficient than untreated ones. It will protect workers from poisonous dust particles less than a 24-millionth of an inch in diameter.

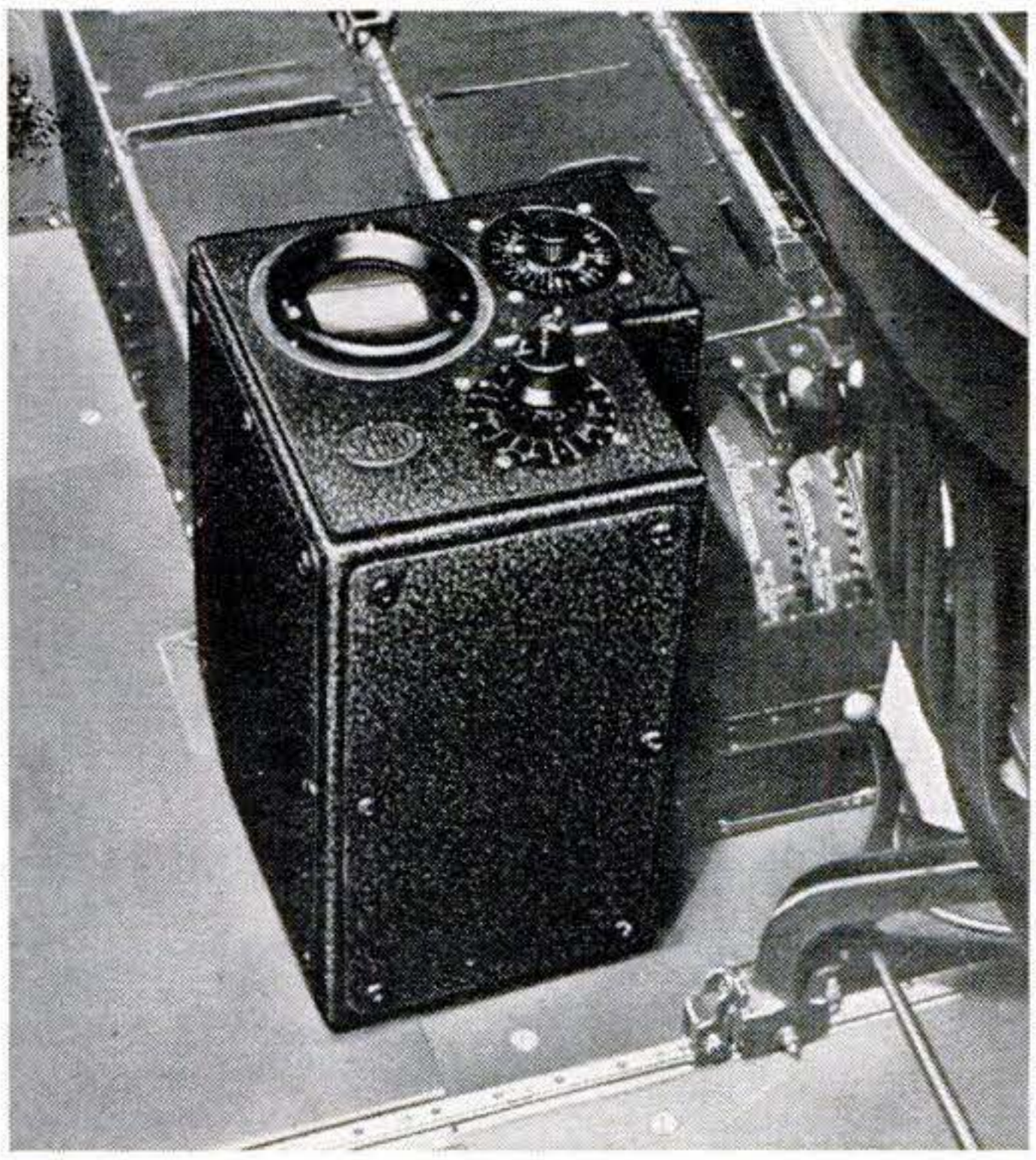
Copyrighted material

Analyzer Spots Aircraft-Engine Troubles Aloft



When a spark plug fires normally, this is the pattern that appears on the oscilloscope. It occurs only when breaker points are open; the straight lines show that points are closed.

When a spark plug is fouled, this is the result. Beginning almost normally, pattern changes to a dead short. Patterns for some ailments are similar but easily distinguished.



The analyzer itself can be installed as a pedestal unit like the one above, beside the flight engineer's chair in a Constellation, or the indicator and selector switches can be mounted on any panel in the plane. Besides throwing ignition and vibration patterns on the 'scope, switches can produce patterns of synchronization between magnetos and between engines.

LIKE a hidden microphone eavesdropping on a secret meeting, a new electronic analyzer for aircraft engines tells just what's happening inside any cylinder of any engine at any time—in flight or on the ground. So accurate that it can spot a single misbehaving spark plug out of the 224 on some big air liners, the analyzer helps avert engine failures aloft and saves valuable hours for ground repair crews by telling them exactly what they're looking for.

The analyzer smells out trouble in two ways. It examines the voltage wave forms in the ignition system for electrical difficulties, and checks on engine vibration (through thumb-sized magnetostriction pickups on each cylinder that translate movement into electrical impulses) for mechanical bugs. In each case, results are shown on an oscilloscope. When operation is normal, the 'scope's shining tracery follows a set pattern; when something goes wrong, the pattern changes—and even minor troubles cause distinctive changes.

Selector switches permit examination, electrical or mechanical, of any engine. If

Copyrighted material

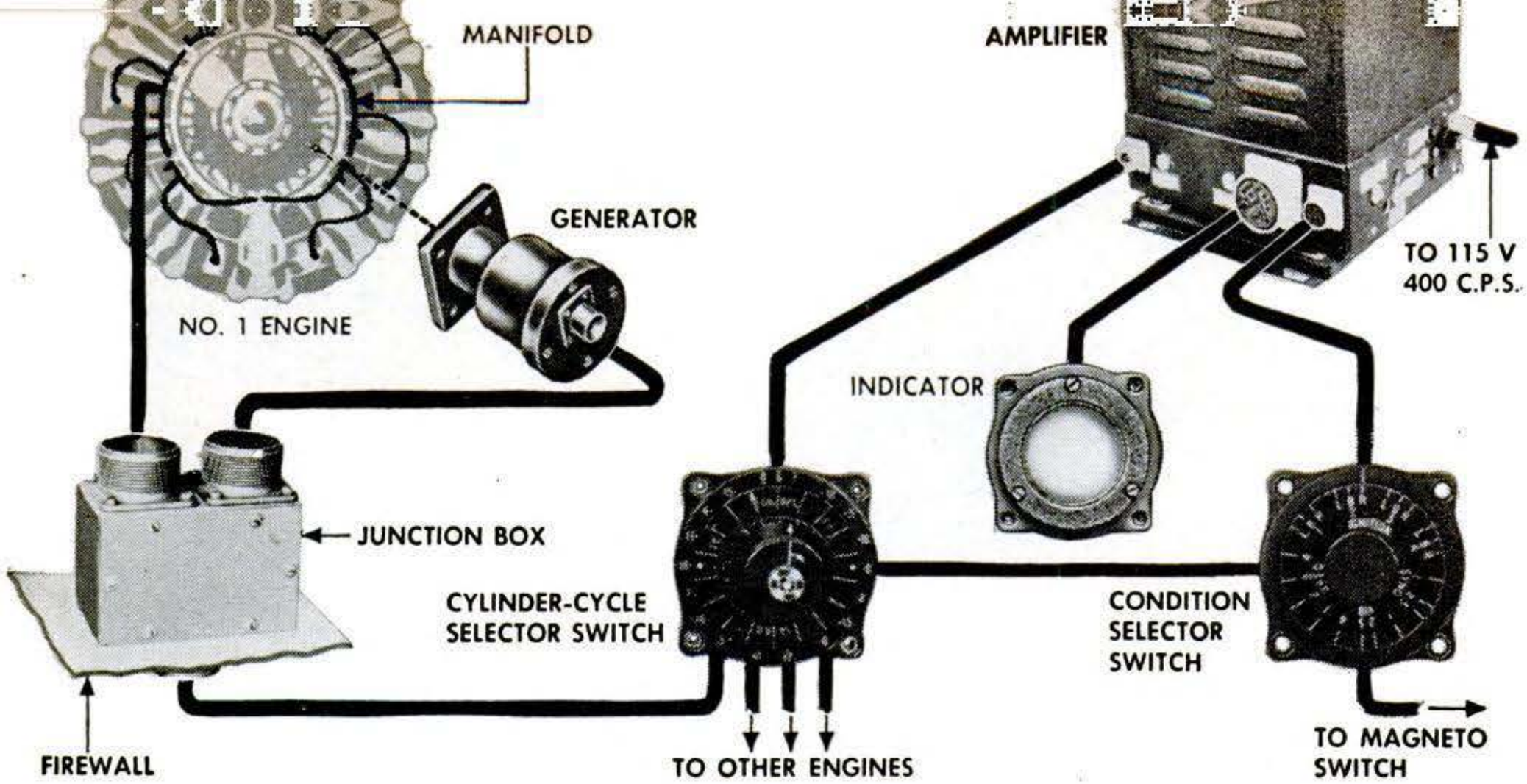
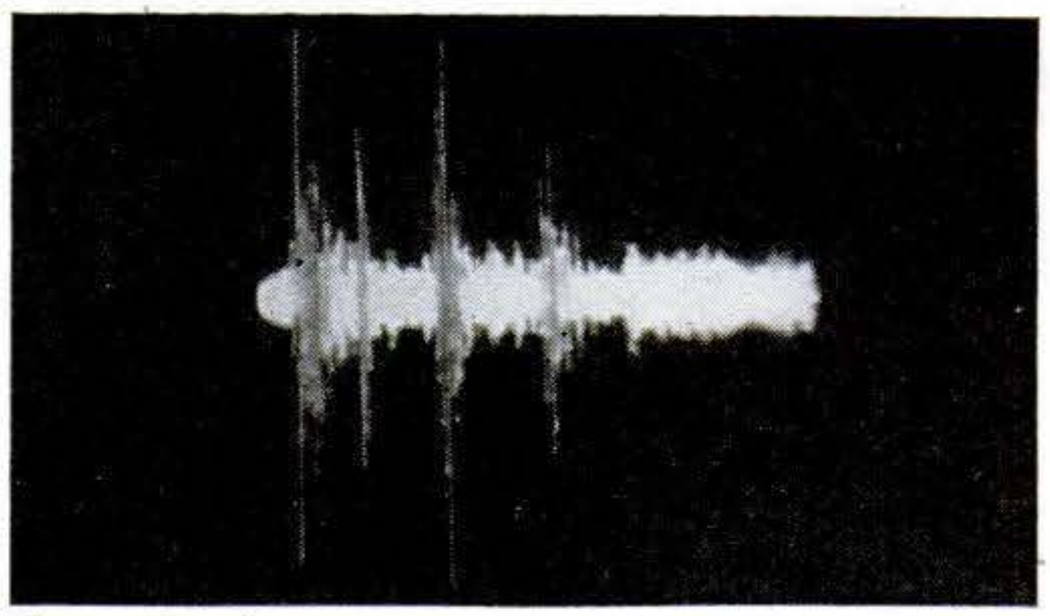


Diagram shows components for four-engine installation; each engine has separate generator.

one engine is acting up, the patterns of all its cylinders can be switched in for simultaneous study. Then the pattern for a single cylinder can be selected and stretched out across the 'scope for close analysis. The generators (one to an engine) that power the analyzer are geared so that their voltage always keeps the patterns in step with engine rotation.

The Sperry Gyroscope Co., Pan American Airways, and Wright Aeronautical Corp. shared in development of the analyzer, which has undergone prolonged tests on a Constellation making overseas flights. END

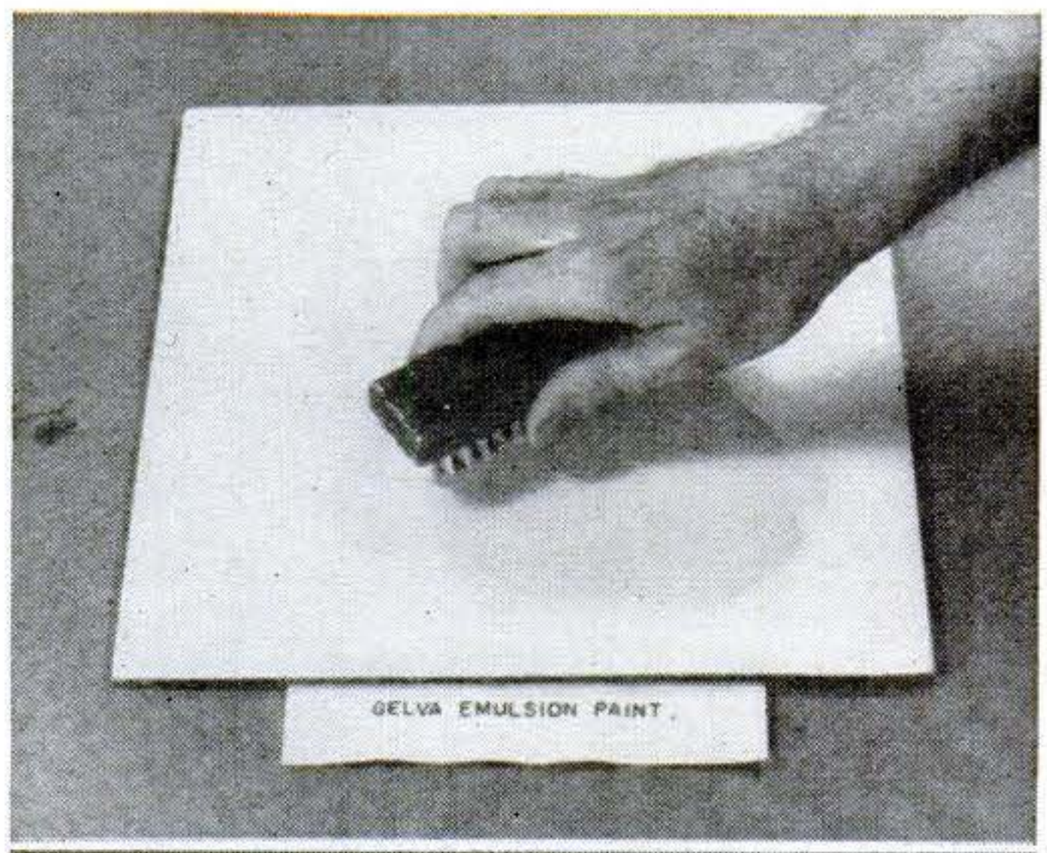


Normal vibration pattern shows "pips" of intake, injection, exhaust, and combustion. Other noises show up when anything is wrong, with height and position of pips identifying them.

Quick-Dry Water Paint Is Odorless and Tough

USING a water-dispersed emulsion of synthetic resin instead of the usual drying oils, a new paint that dries in half an hour is said to rival the appearance and durability of oil finishes. Its ability to withstand washing and scrubbing, in contrast to other water-mix paints, is illustrated in the two photographs at the right.

Among other advantages ascribed to the new paint, which is produced by Shawinigan Products Corp., of New York, is the fact that it dries without odor, since the drying process involves merely the evaporation of water to leave a film of pigment and resin. It can be applied either by brush or spray, and while the present product is recommended for interior use, exterior paints of the same type are expected to be put on the market later.



Copyrighted material

Easing Trucker's Job

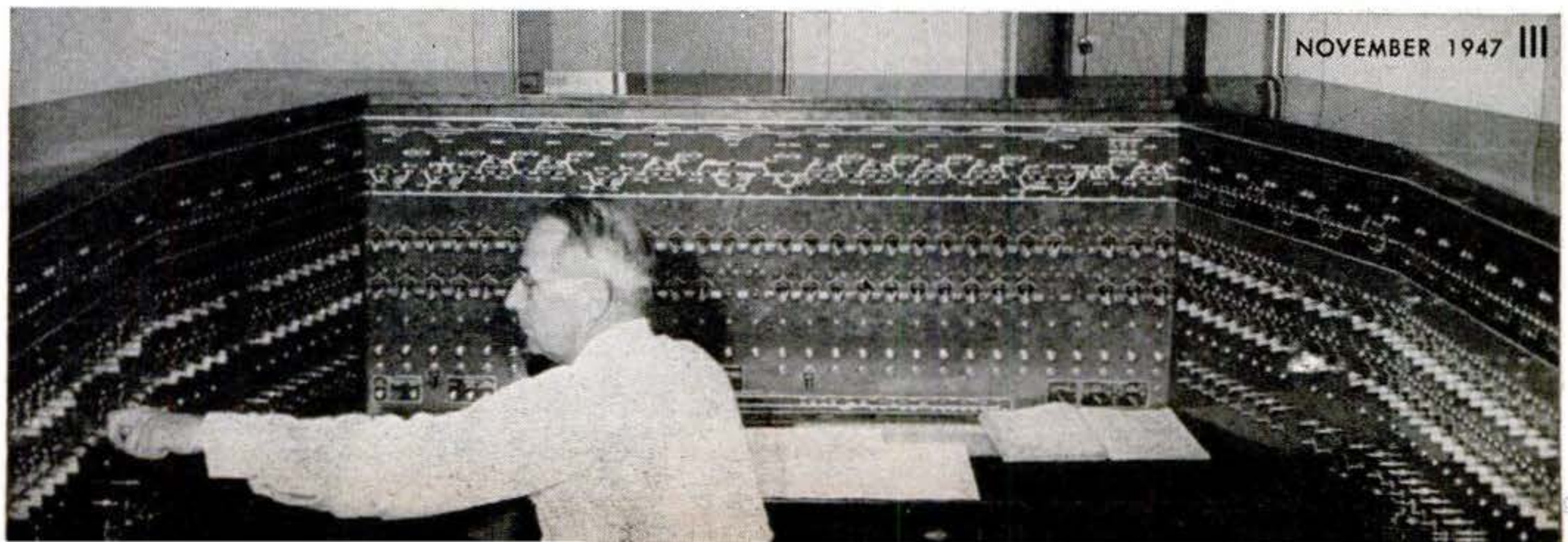
A BOON to drivers, an automatic lift gate installed on rear of this truck saves a lot of back-breaking work. Operated by power take-off from the truck engine, it facilitates the handling of heavy and bulky loads, thus speeding up delivery and pickup schedules. Upper view shows the automatic platform lowered to ground, ready to take on a load. Lower picture shows driver and his helper taking it easy as lift gate does the work.

Climbing to the Rescue

ANOTHER new type of lift is this contraption that climbs up the side of a building to rescue persons trapped by fire. Called a "Mechanical Fly" by its inventor, W. J. Bernett, of Kansas City, Mo., it travels along the ground on rubber-tired wheels. Its 7½-horsepower engine enables it to climb up an "I" beam already installed outside the building as shown here, operating as an outside elevator without cables.

Remote Control Speeds Rail Traffic

TRAIN operation under written orders is on the way out. Dispatching boards like the one shown below used by the Union Pacific permit centralized control of rail traffic. Through finger-tip manipulation of switches and block signals, dispatchers have continuous control over traffic along hundreds of miles of track. The Union Pacific already has 300 miles of remotely controlled trackage under operation between Daggett, Calif., and Caliente, Nevada. A 329-mile extension into Salt Lake City will make it the largest such system in the world. It is estimated that the smoother flow of traffic by this method increases train speed by more than one third of present rates.



Cub Tractor —Toy Version

WHILE production was under way for delivery of the first new Farmall cub tractors to America's farmers, the International Harvester Co. also was tooling up on a pint-size toy version for Junior.

The model, shown here being assembled, is a faithful reproduction of the McCormick-Deering Farmall, scaled down to 1/16 size. It is six inches long by three inches high and can be assembled and knocked down at will. Clips are used for fastenings.

The tractor's interlocking parts are made of Tenite #2, a butyrate plastic. This material was used because, while medium-hard and durable, it is both pliable and flexible. Its natural luster also shows off the familiar Harvester equipment red.

Tires of the small tractor are of real rubber, and on later models they will have treads. Although this first production model of the toy is not mechanized, plans are under way to include this feature in improved versions. Also being developed is a line of quick-change farm implements that can be assembled and attached just like those on the big tractor Papa operates.

Copyrighted material

Tune In a Painting

PSM photos by Hubert Luckett

Color facsimile equipment is compact and simple. Here is the entire mechanism, with the receiver on the right of the transmitter. At present, the Federal Communications Commission limits facsimile to FM bands.

Transmitter is shown sending PSM's cover painting—the first operation of its kind. After transmission, a Kodachrome of the cover in the receiver was processed with regular color plates for the presses.

TAKE a good look at the front cover of this issue of your *Popular Science Monthly*. You are looking at something you have never seen before—a picture that was transmitted by radio in one operation and imprinted on a sheet of ordinary paper.

This is known as color facsimile. It is the product of years of effort to transmit

Copyrighted material

an image by wire or radio and reproduce it perfectly on ordinary paper at the receiving point. It was developed by Finch Telecommunications, Inc., of Passaic, N. J. Finch labels it "Colorfax."

The first Colorfax machine was built by Dr. LaVerne R. Philpott in his home workshop with "a drill press, a lathe and a couple of screwdrivers." It was demonstrated this fall in the WGHF studio in New York, and a commercial model, which will plug into any FM radio and will retail for about $150, is being designed now.

As a communications device, Colorfax opens up a whole new world to the home owner and businessman alike. Here are some of the things that can be done with it:

You can listen to a radio lecture on any subject under the sun and look at illustrations accompanying the lecture as they roll out of the facsimile machine—in color. If the lecture is on atomic energy, you can support your understanding of what you hear with colored charts. If it's on automobile repair, you can look at the part under repair in color. Afterward, if you want to, you can tack the picture up in the garage.

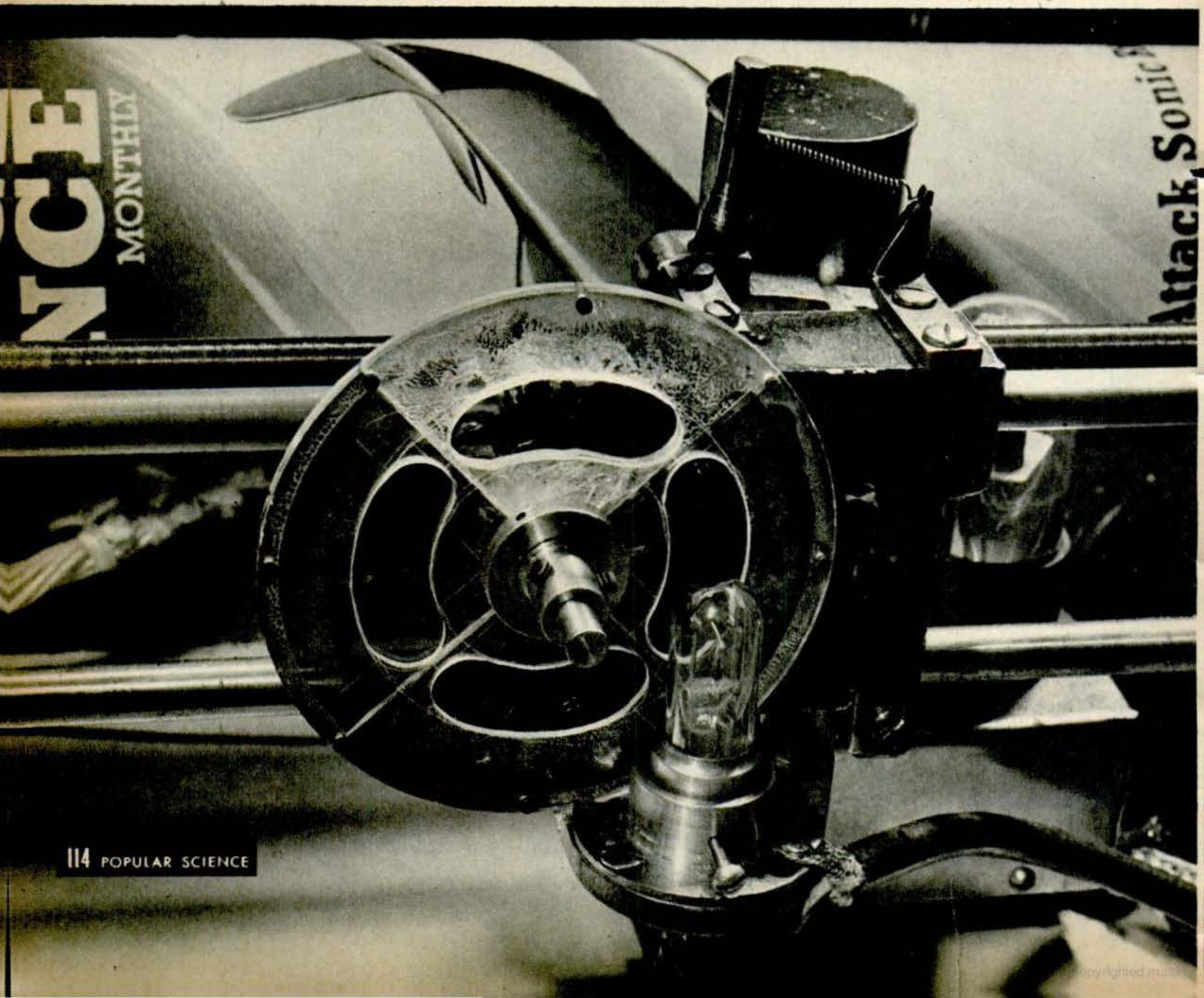
That distinguishes facsimile from television. Television transmits a fleeting record, facsimile a permanent one.

Sunday morning's comics—in color—can be delivered to your children right in your own home by radio, along with news for the grownups that is "printed" as it is on a newspaper page.

Facsimile puts a genie in any man's house, answerable to command. If the whim strikes you, you can squirt the incoming pictures or news onto a wire recording tape or an ordinary phonograph record and then "print" them on paper at your leisure. That's possible because the radioed impulses causing the facsimile receiver to work can be converted into either sound or something to look at. The sound isn't musical. It's like a mouse's squeak intermittently interrupted by a scratching noise.

Facsimile is not new. Color facsimile is brand new. Good black-and-white facsimile

This geared disk, rotating in the transmitter between pin-point light and the painting, filters colors into primary components—yellow, red and blue. Black is added to strengthen dark areas. Filtered, colors become degrees of light intensity.



was made possible more than a decade ago when a means was found for converting the tone gradations on a photograph or a printed page into impulses that could be sent by wire or wireless, and then be reconverted on photosensitive or electrosensitive paper into a duplicate of the original. Facsimile was used extensively during the war by the armed services. Even before the war, miniature facsimile newspapers were being broadcast daily by 19 U. S. radio stations to several thousand owners of receiving sets. Today ordinary facsimile transmits news from the United Nations headquarters on Long Island, New York, to a central distributing point. The transmissions are in Chinese, Arabic, Hebrew, Russian and other languages, doing away with the bother of translation.

Experiments in Color

That's fine for black-and-white reproduction. But how about color? Up to a few months ago, for any practical purpose, it was no go. Occasionally a color picture was sent experimentally by radio. This required breaking down the picture into its primary colors, separating each color, transmitting each one separately, and then putting the whole mess together again at the receiving end. It took too long. There was too much chance of "bad registers"—one color overlapping another.

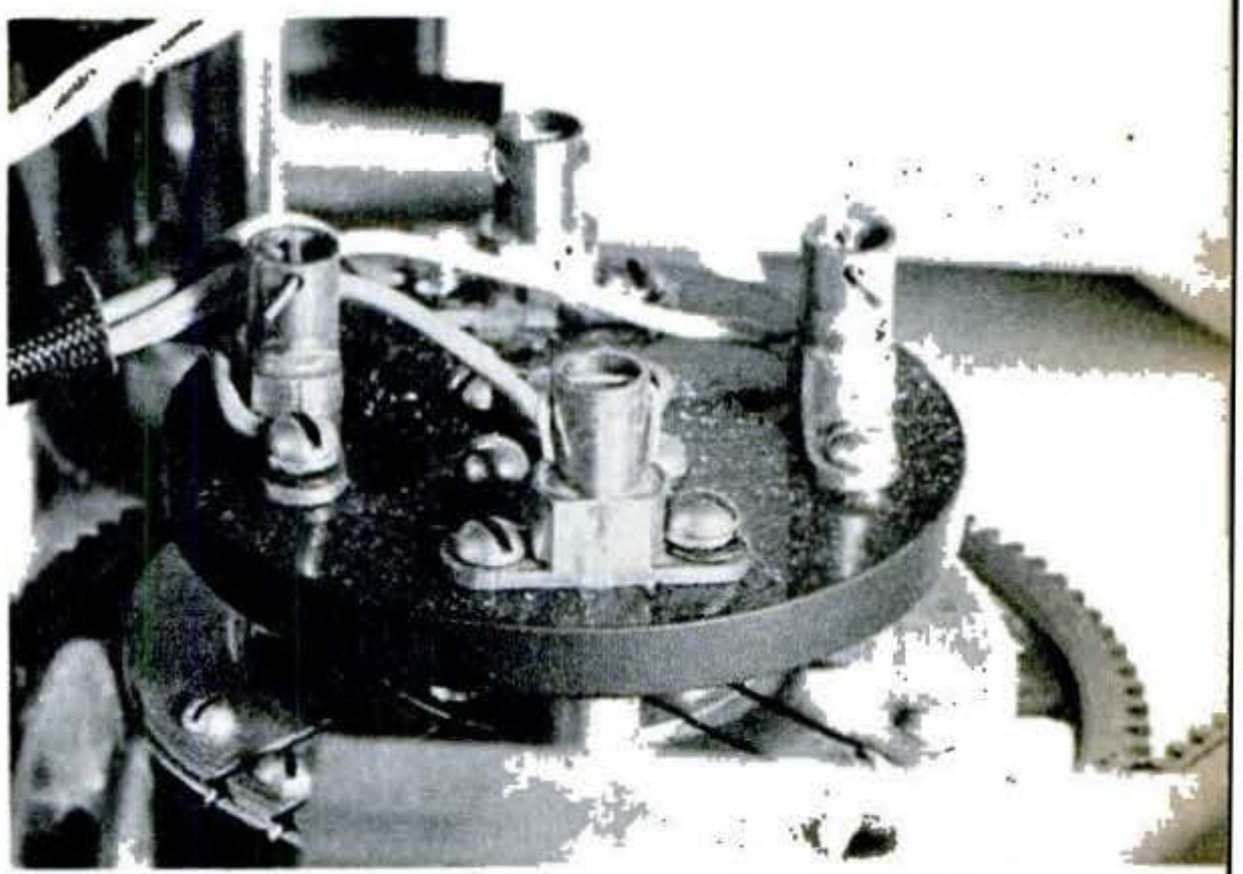
There had to be a simpler way. There was. Capt. W. G. H. Finch, who obtained his first facsimile patent more than 10 years ago, found it. Color facsimile not only is simple, but for the first time in facsimile of any kind it uses plain, ordinary paper—any kind of paper will do. The use of paper that doesn't have to be sensitized and sometimes moistened to boot, or photo-developed after receipt of a transmission, makes operation of the receiver easy.

Light Scans Subject

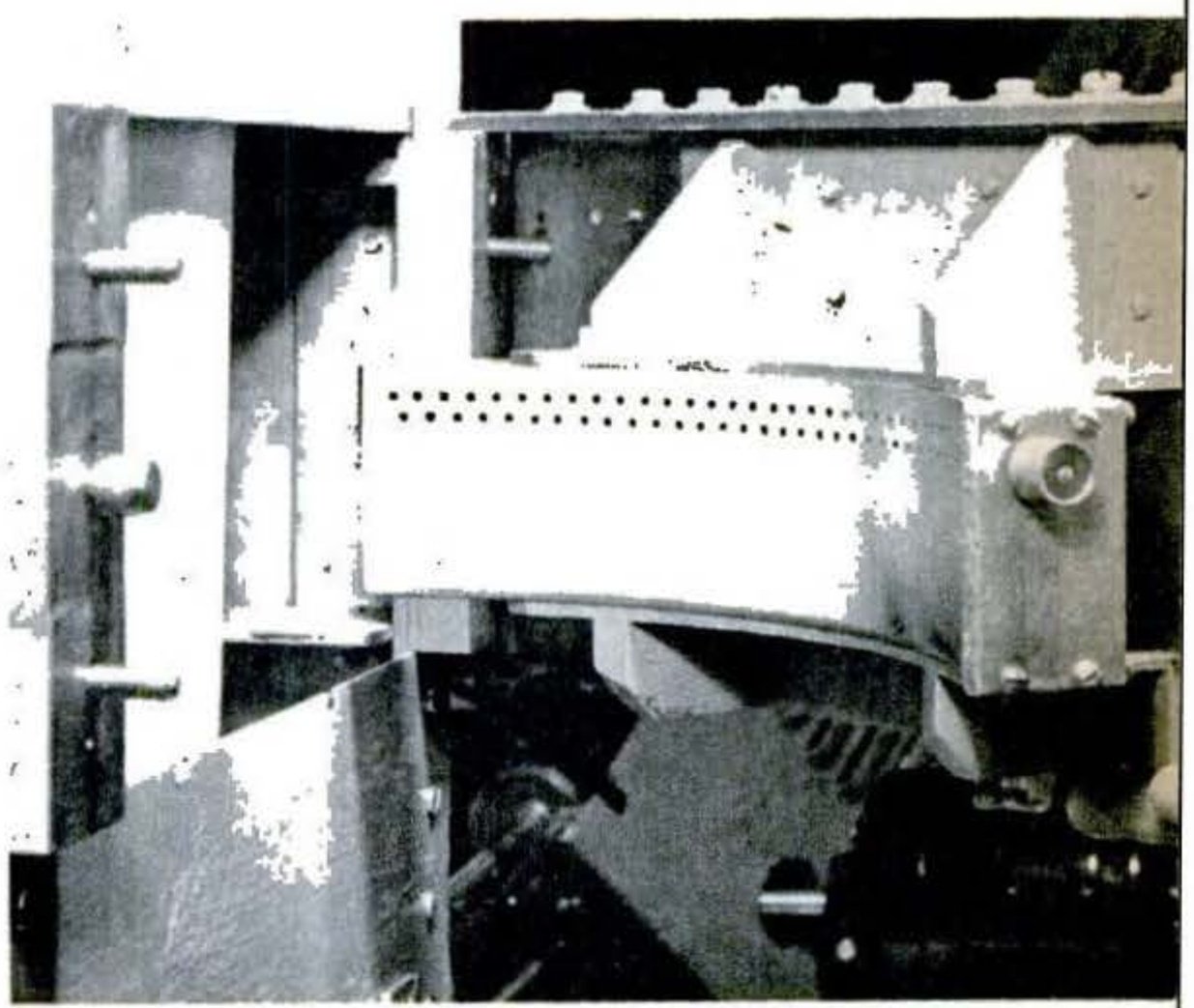
This is the way color facsimile works: The item to be sent, be it picture or words, is fastened to a revolving drum. A pin-point light looks at the item with a fineness of 100 lines to the inch. The light is reflected into a photoelectric cell, which transforms variations in the intensity of the reflected light into electrical energy. A filter disk separates the colors from one another. The light source, photocell and filter are mounted on a single carriage that moves along as the drum rotates. The energy from the photocell is amplified and imposed as modulation on a carrier wave.

The receiver is something else. Essentially it is a series of mechanical pencils that can be made to mark a line on paper

Co-inventors of Colorfax are W. G. H. Finch (left) and Dr. LaVerne R. Philpott, who also designed the first U. S. Navy radar.



Commutator, geared to receiver's turntable, distributes signals in proper sequence to the colored pencils that trace the design.



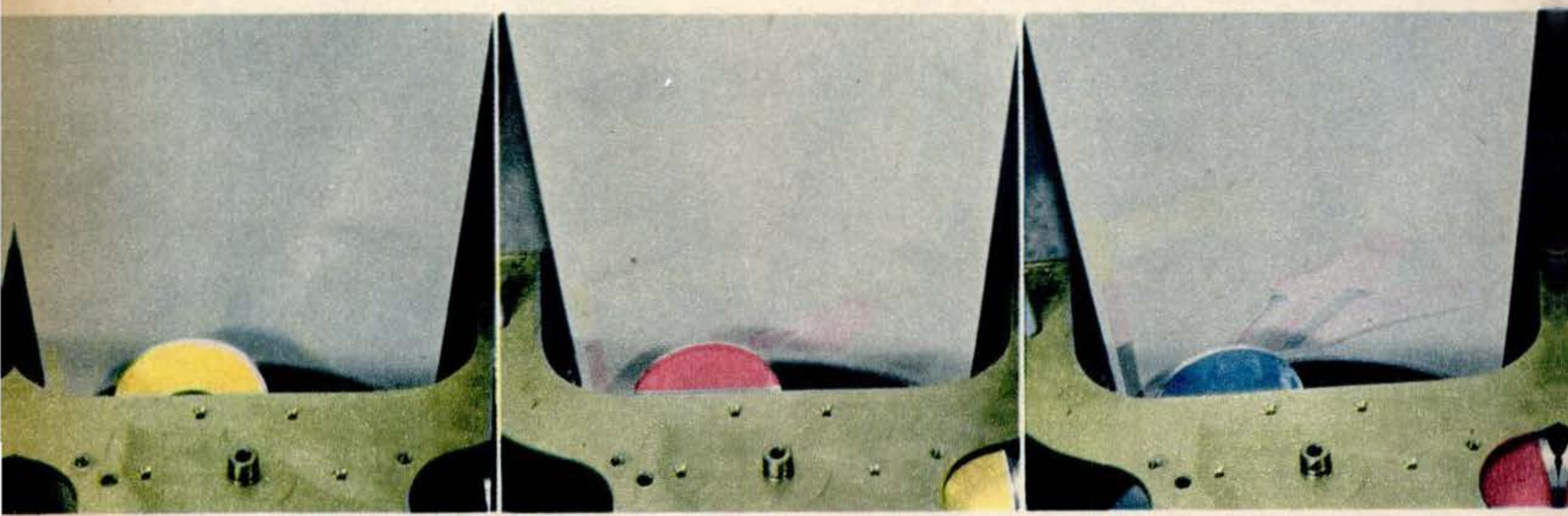
Paper support has the same curvature as the rim of the turntable. Tiny holes in the backing plate hold paper in place by vacuum.

Copyrighted material

Colored pencil, actuated by a voice coil, marks the paper when its turn comes if the incoming signal tells it to. The pencil is slightly inclined against the surface of the paper, and entire unit rotates. This keeps pencils sharp and insures fine lines.

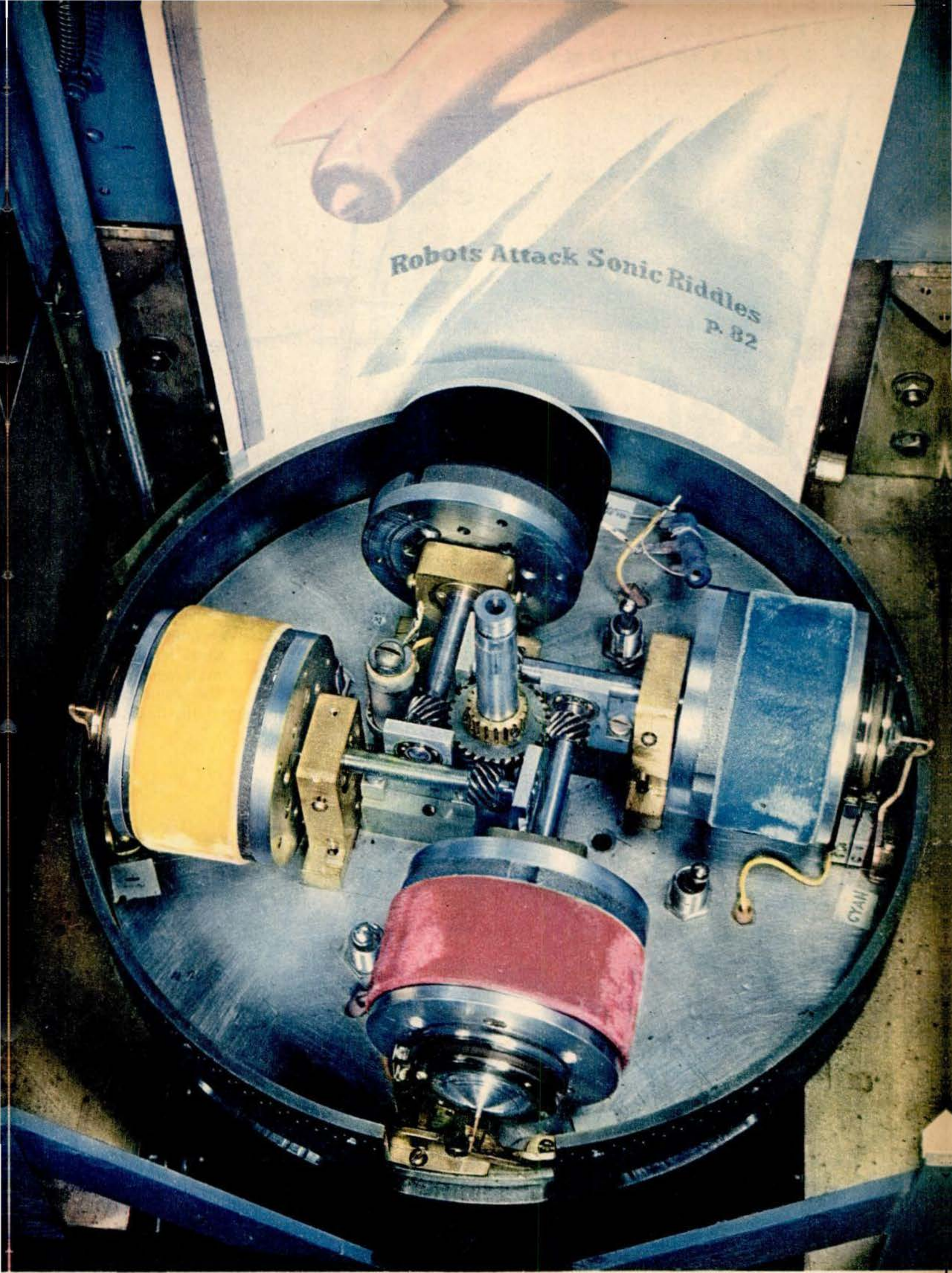
in accordance with the instructions it gets from the transmitter. When the portion of the item before the scanner in the transmitter is red, the transmitted signal instructs the receiver to make a red mark on the paper. If the signal says blue, the paper gets a dose of blue. Mixed colors are produced by blending the three primary colors, and black is added to improve contrast and strengthen dark areas.

Black-and-white facsimile can be stepped up to a transmission speed of 44 square inches a minute (equivalent to about 500 words on a printed page), but color facsimile has a limiting factor. Since four pencils have to be given a chance to make a mark on every line, the color transmission is only one-quarter as fast as black-and-white, which requires only one mark per line. Sending a 7- by 10-inch picture in full color, for example, requires about 15 minutes, although this speed is expected to be doubled in the commercial Colorfax model now being designed. END



These separated color effects show what happens when pencils are put in use one at a time. In actual operation, however, all four colors are applied line by line to produce the complete picture, as seen above the turntable on the opposite page. With four black pencils, the receiver can handle ordinary black-and-white facsimile.

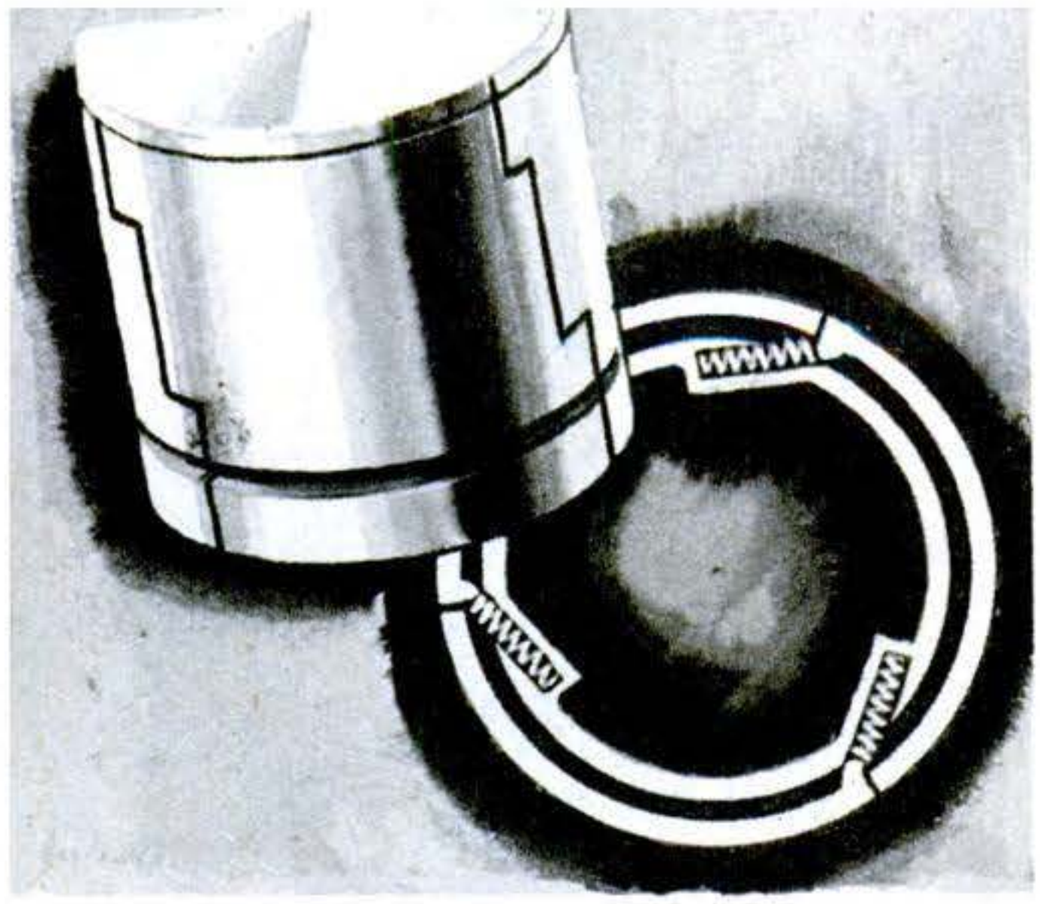
Copyrighted material



Copyrighted material

Rockers Lift Loads. Curved, rockerlike runners, extending downward from the sides of this novel hand truck, help lift heavy loads by allowing it to tip easily into a vertical position. Patented by John Donald, of Birmingham, England, the truck is turned up on end to receive the load, then pulled down again to raise it. As it returns to a horizontal position, two small wheels, which extend slightly below the rockers, come in contact with the pavement, and it is ready to be rolled away.

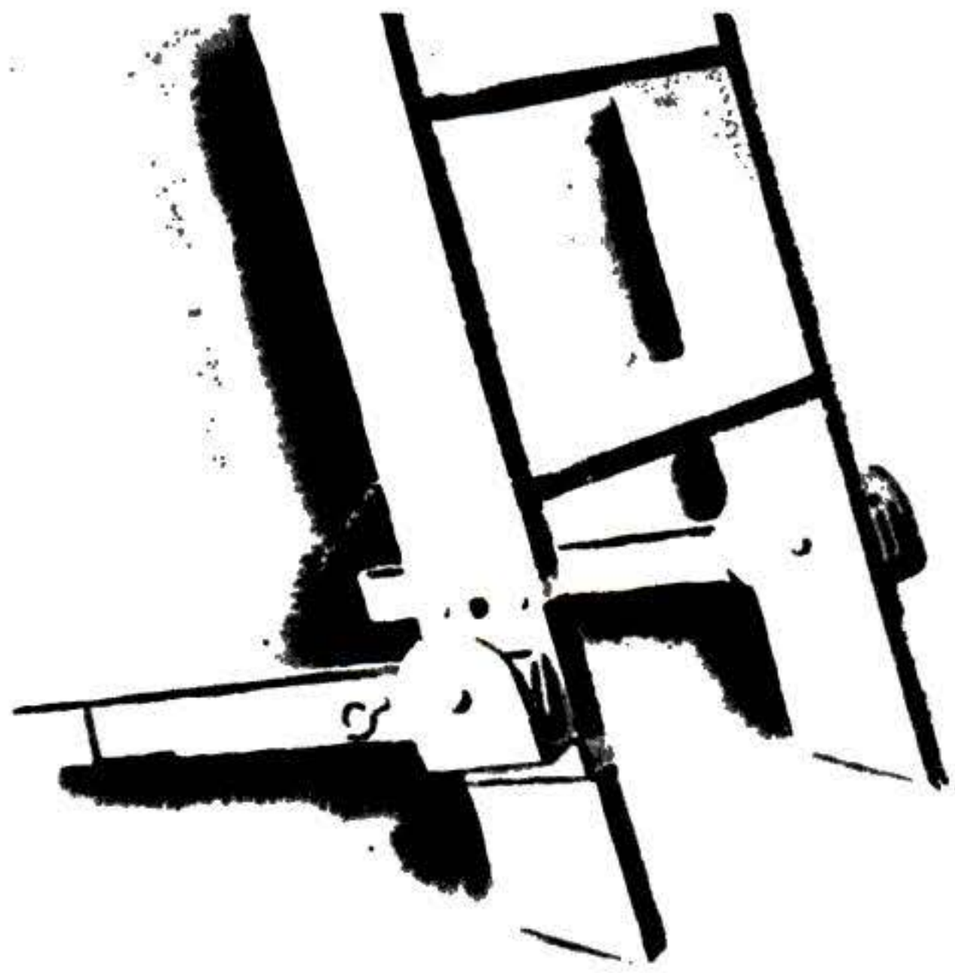
Hand Phone Packs Dial. A phone that combines speaking, hearing and dialing systems in a single hand unit is the invention of Knut Blomberg and Ralph Lysell, of Sweden. Lifting it closes the circuit.



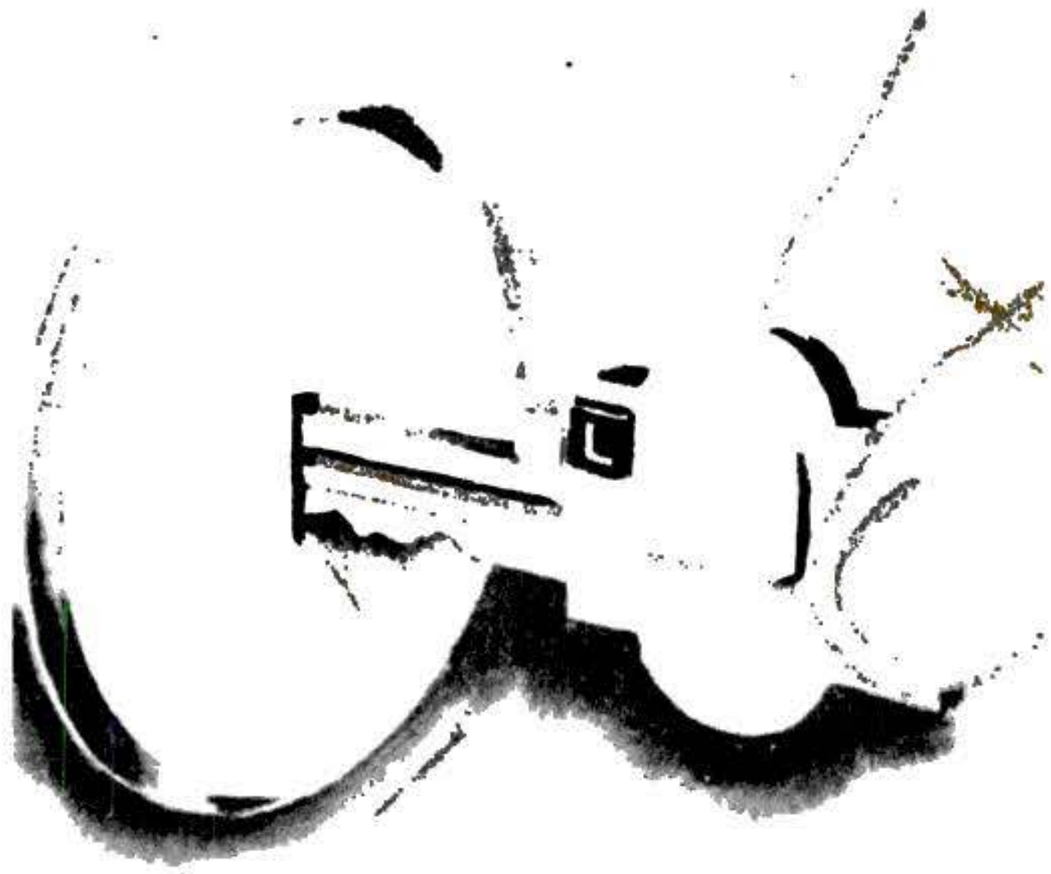
Piston Needs No Rings. This self-expanding piston, invented by George P. Floyd, of Akron, O., has a three-part shell, forced outward by three springs, that takes up wear and prevents loss of compression.

Copyrighted material

Pitchfork Pitches Itself. A self-pitching pitchfork that really lives up to its name is the invention of George H. Gascoigne and Jonas A. Kingston, of England. When driven into the earth and pulled back to loosen it, the fork forces down a spring-tensioned rod clamped to its handle. When the soil yields, the rod springs back to an upright position, giving the fork an abrupt forward thrust that snaps its load some distance away. An extension handle adapts the device to any ordinary fork or spade.



Leg Props Brace Ladder. Your ladder won't slip out from under you with the braces devised by Victor M. Fowler, of Spokane, Wash. Fixed firmly against the ground, they keep the ladder from sliding.



Key Records Lock Position. For doors that don't have snap locks, Louis Oberfield, of Brooklyn, has devised a reminder key. It shows an "L" on its side after locking door, an "O" if door is open.

Copyrighted material

Air view of White Sands shows V-2 assembly tower and slim launching tower for Wac Corporals.

Rockets Outgrow Their Desert Range

Research at White Sands is producing missiles too big and too powerful to be fired except with an ocean near by.

WHITE SANDS, the rocket proving ground in New Mexico that has launched dozens of German and American missiles on the trail of the secrets of outer space, is working itself out of a job. From research at this bright desert post are coming new rockets too powerful to be fired within its limited confines.

Flights of V-2s, postwar Wac Corporals and other test rockets are providing data for bigger, longer-range missiles—weapons of tomorrow that may dwarf the Germans' projected A-10, the 110-ton, two-section monster designed to cross the Atlantic for an attack on New York City. Already a number of made-in-USA rockets are in the works: North American Aviation's Nativ, Glenn Martin's Neptune and others. Most, however, are intended purely for experimental use.

When the new, longer-range rockets are ready for flight, they may not start from White Sands, which has an area suitable only for missiles that travel less than 125 miles. The need for larger proving grounds, far from densely settled areas, was vividly emphasized last May, when a wild V-2 from White Sands crashed near Juarez, Mexico.

Aware of this danger, Army, Navy, and Air Force authorities have already begun surveys of other possible locations for a big rocket test center, and recently recommended El Centro, Calif., a wartime Marine air station near the Mexican border. Other places under consideration are Cape Flattery, the northwestern tip of the United States, and Point Mugu, near Santa Barbara, Calif.

El Centro has the advantage, however, of a range 800 miles down the Gulf of California (and even beyond that nothing but open sea), with land on either side of the gulf for observing stations to track rockets. Test missiles could be followed for hundreds of miles with radar, theodolite and Doppler-effect equipment. The firing range covers sparsely populated sections, but El Centro itself is only 100 miles from San Diego and has good rail connections.

Other countries are also planning long-range rocket testing grounds. Australia has begun work on a $21,000,000 mammoth shooting gallery extending across 3,000 miles of desert and sea. Rockets are to be launched at Eucla, in Australia's barren western desert, and aimed toward Christmas Island in the Indian Ocean. Tracking stations will be set on land and ships.

Copyrighted material

Observation blockhouse is at right of towers.

"Gassing up" a V-2 (below) calls for tons of alcohol and liquid oxygen. Then the rocket is ready to take off in a mushrooming blast of fire (right). New missiles now in the works may be too big for White Sands, requiring a longer shooting gallery.

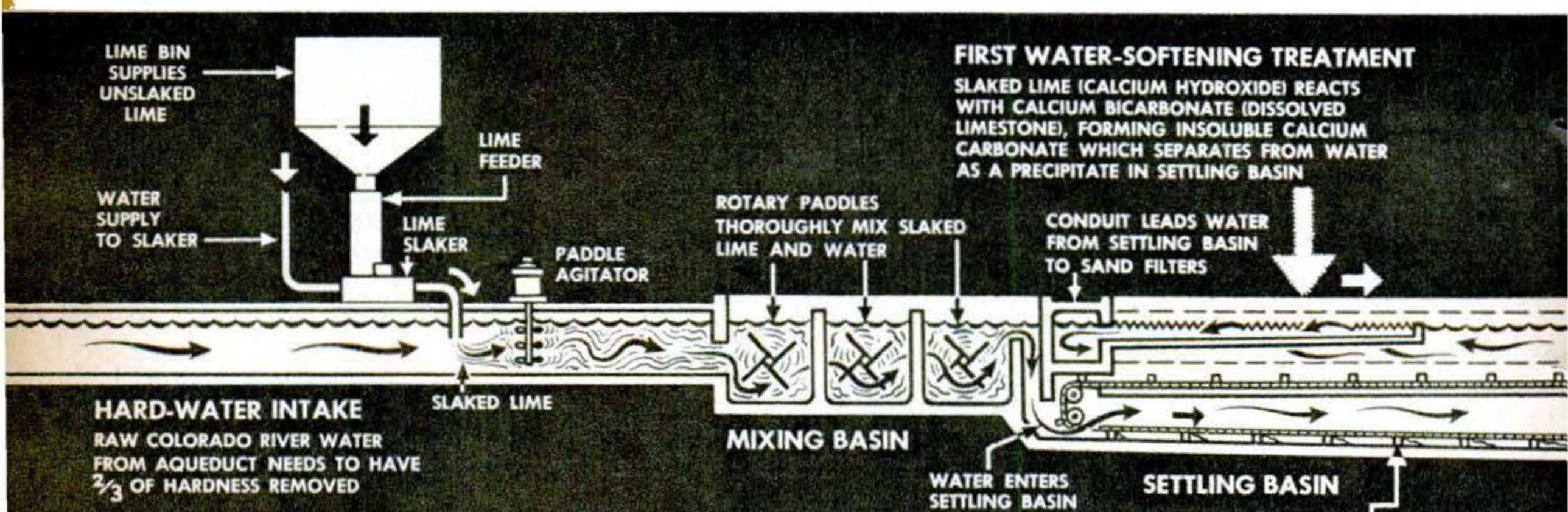
Six Billion Soft Drinks A Day

THE world's largest water softening and filtering plant, at La Verne, Calif., turns six billion glassfuls of hard water into soft water daily. How it works illustrates the solution of an outstanding problem of everyday living.

Hard water makes soap curds; it rings the bathtub; it soils laundry; it forms ruinous scale in the boilers of industrial plants—all because it contains dissolved limestone and other "hardness-forming" minerals, such as calcium and magnesium sulphates. Soft water contains only unobjectionable, "non-hardness-forming" minerals—such as sodium chloride (common salt) and sodium sulphate—or none at all.

New Yorkers drink the nation's softest natural water, containing only 30 parts of "hard" minerals per million, but few American cities enjoy soft water until chemicals and settling basins have done their job. Chicago's water is four times harder, and that of Dayton, Ohio, 11 times. Raw Colorado River water flowing to Los Angeles, Calif., contains 360 parts per million, of which two-thirds are removed as shown.

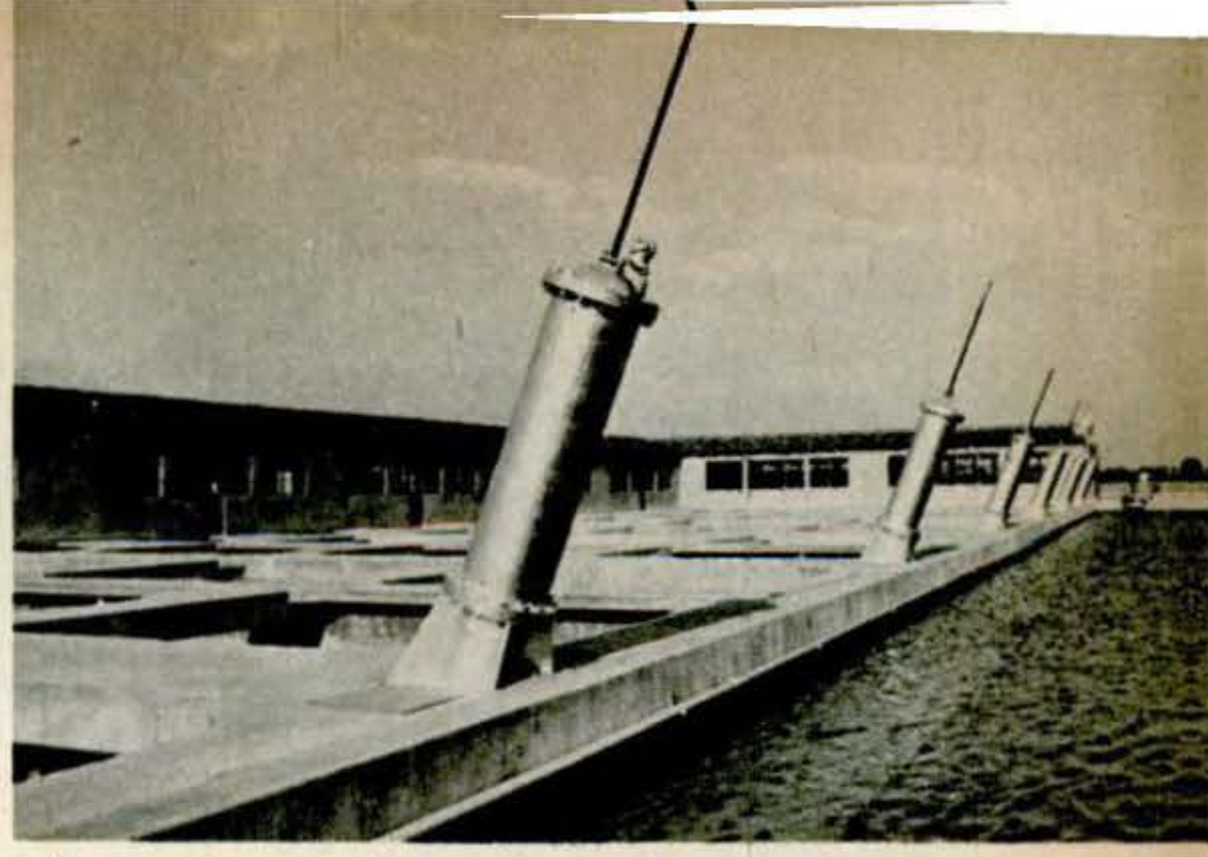
First treatment with slaked lime, stirred into water by three-level mixer spinning 95 times a minute, removes dissolved limestone.



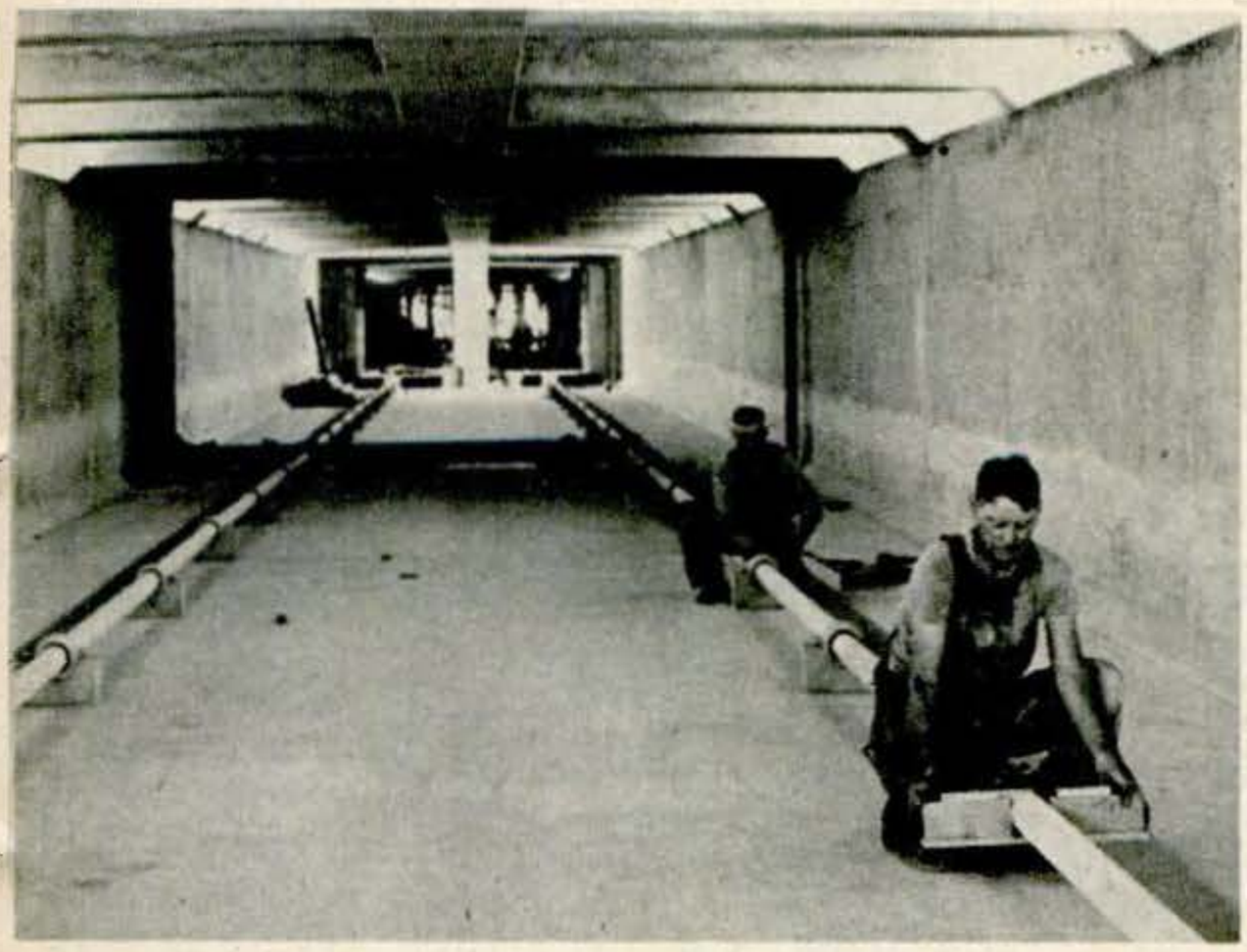
Largest in world, California water-softening and filtering plant illustrates how the process works. The two principal treatments reduce hardness of the water from 360 to about 125 parts per million.

Copyrighted material

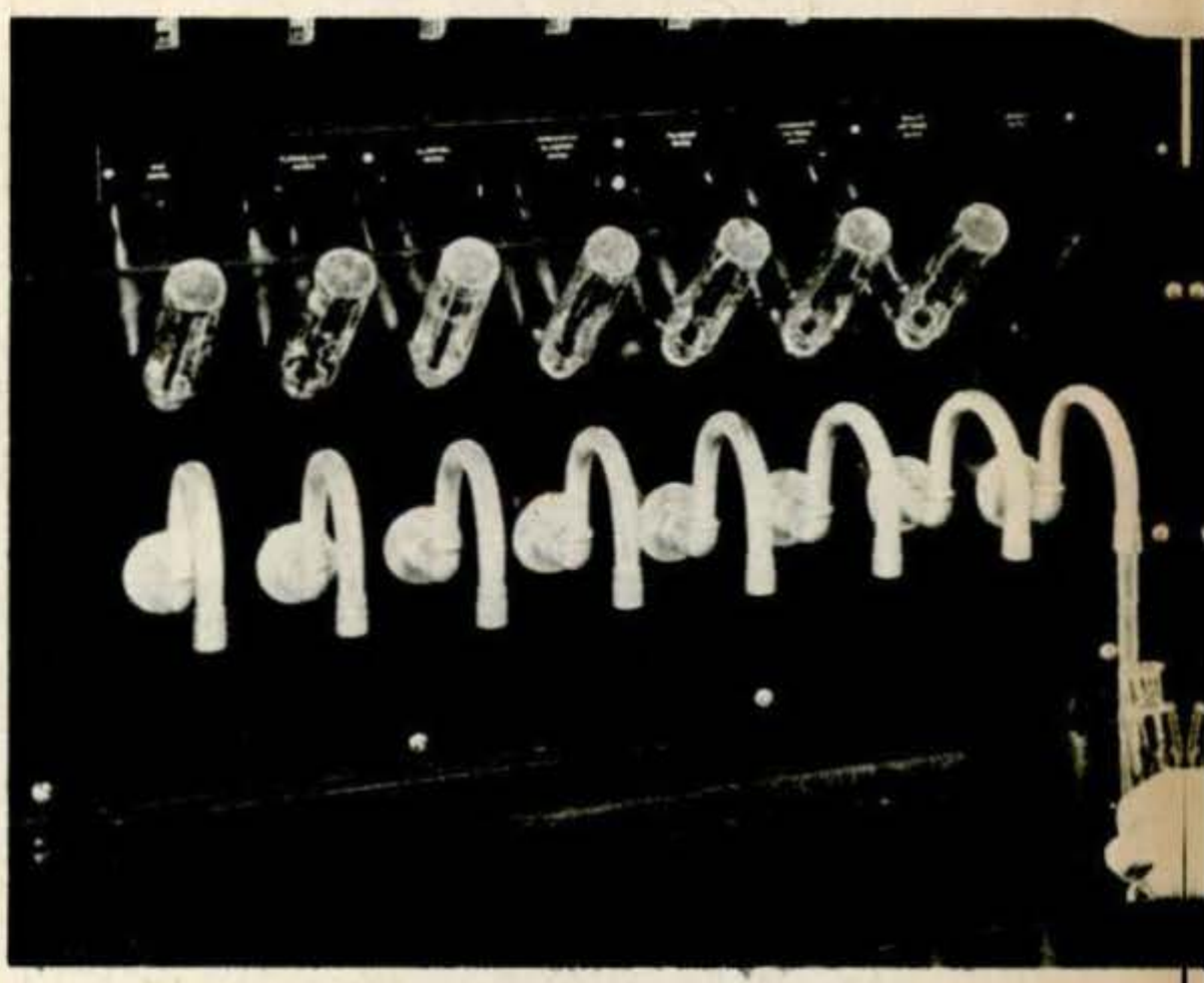
Second treatment with white crystals of artificial zeolite, shown being collected with vacuum tool, takes out remaining minerals.



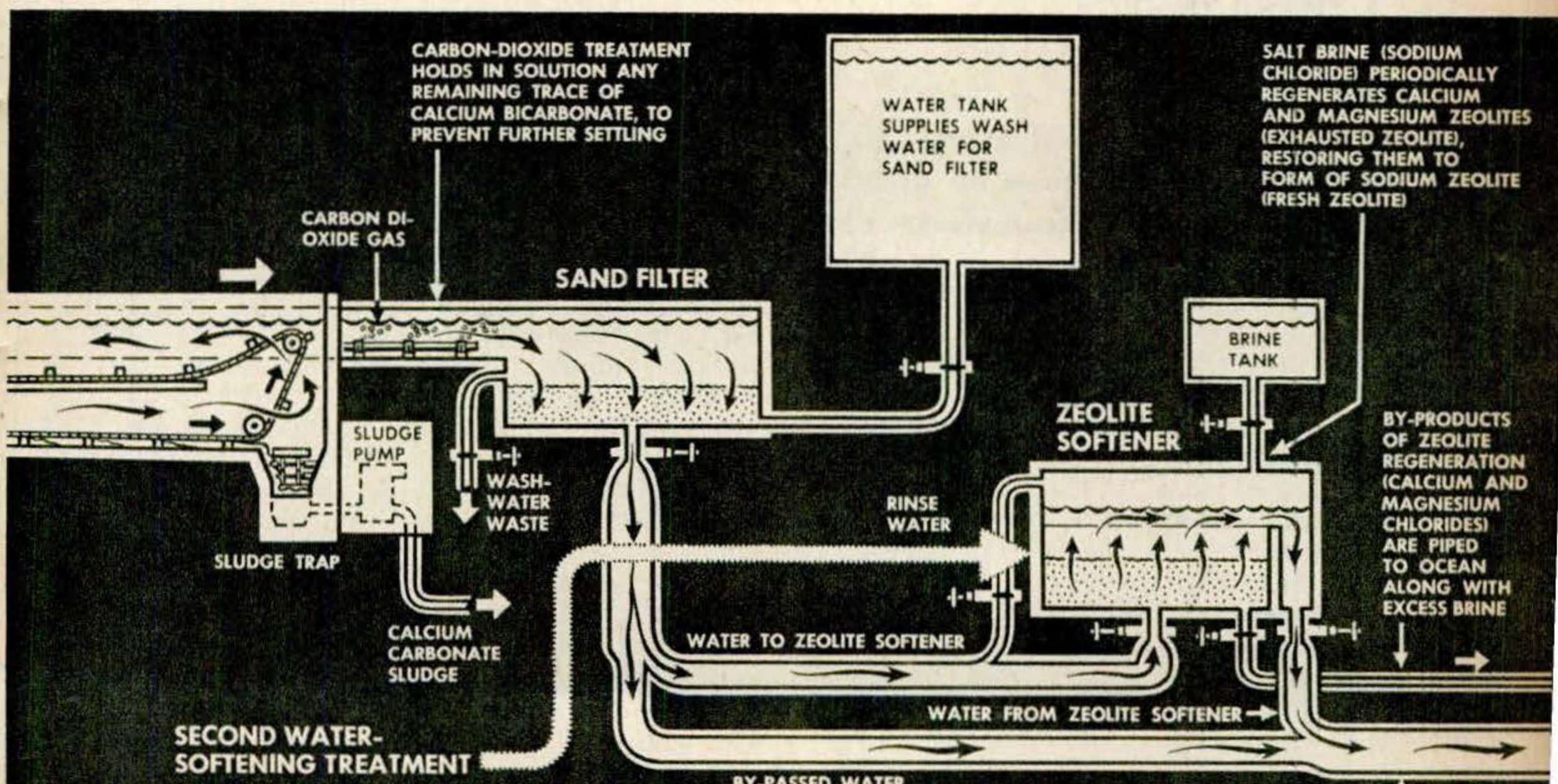
Settling basin holds the water getting lime treatment. Objects like guns are tops of hydraulic gates for water used to wash filters.



Giant scale of the water-softening plant is shown by size of this conduit, which delivers water from settling basin to sand filters.



Samples of water from eight points throughout the plant are withdrawn here for testing. If water is too soft it can corrode pipes.



Copyrighted material

Portrait demonstrates the excellent gradation obtainable, ranging from delicate skin textures to deep shadows.

A winter landscape, seen edgewise, shows deep picture penetration in dark parts, shallow in lighter sections.

Printing Photos Inside Glass

A sun lamp, an oven and a negative impress permanent pictures on metal particles in Corning's photo-glass.

By Alton L. Blakeslee

GLASS with a "memory" is the latest creation of the 6,000-year-old art of glassmaking. This wonder glass captures lifelike pictures, in colors, inside any object into which the glass is fashioned. There they are held forever safe from bending, scratching, fading or weathering—everything but outright breakage. With this glass, photography obtains its missing element—permanence.

Discovered in the laboratories of the Corning Glass Works, the new glass is crystal clear and looks and behaves just like any other good glass. It can be worked into delicate goblets, or church windows—into any desired thickness or shape.

Whatever its shape, all this glass needs to remember a picture is a photographic negative, ultraviolet light, and heat. The remembering is done by tiny metallic particles, completely invisible even under a high-powered microscope, that are mixed into the glass when it is made.

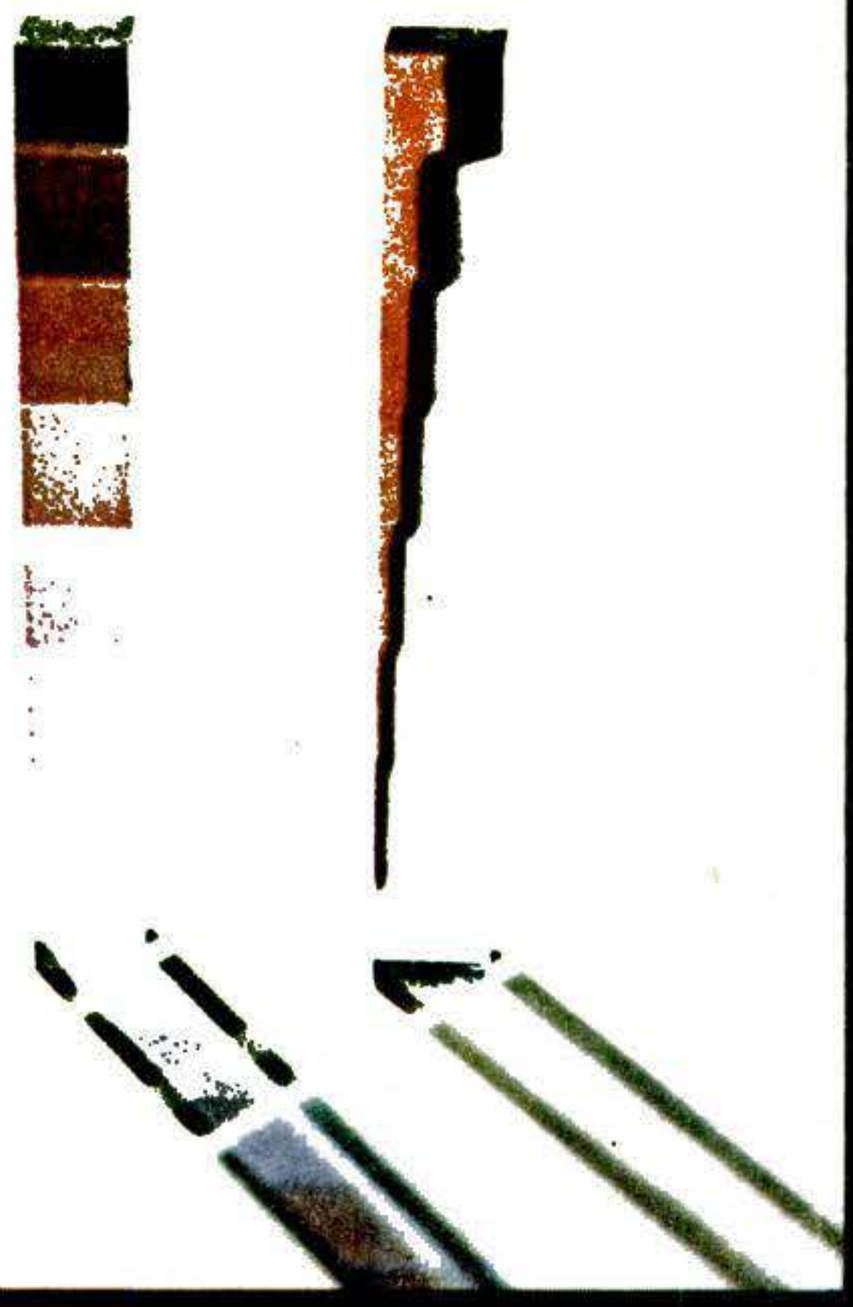
Once made, the glass must be kept out of sunlight or other ultraviolet sources until it is used, but no other precautions are needed. The process can be carried out in ordinary room light, and it requires no chemicals. The negative is placed against the glass and then exposed for two or three minutes to ultraviolet light from a sun lamp or other strong source. When the negative is removed, the glass to all appearances remains unchanged, still clear and transparent. But when it is placed in an oven or kiln and heated to 1,000° F., the picture quickly begins to appear.

This picture is not just on the surface. It extends inside the glass and may run as much as two inches into it, producing a three-dimensional effect. It will appear in one or a combination of colors—white, purple, orange, ruby, yellow, brown or blue—according to the kind of photosensitive glass used.

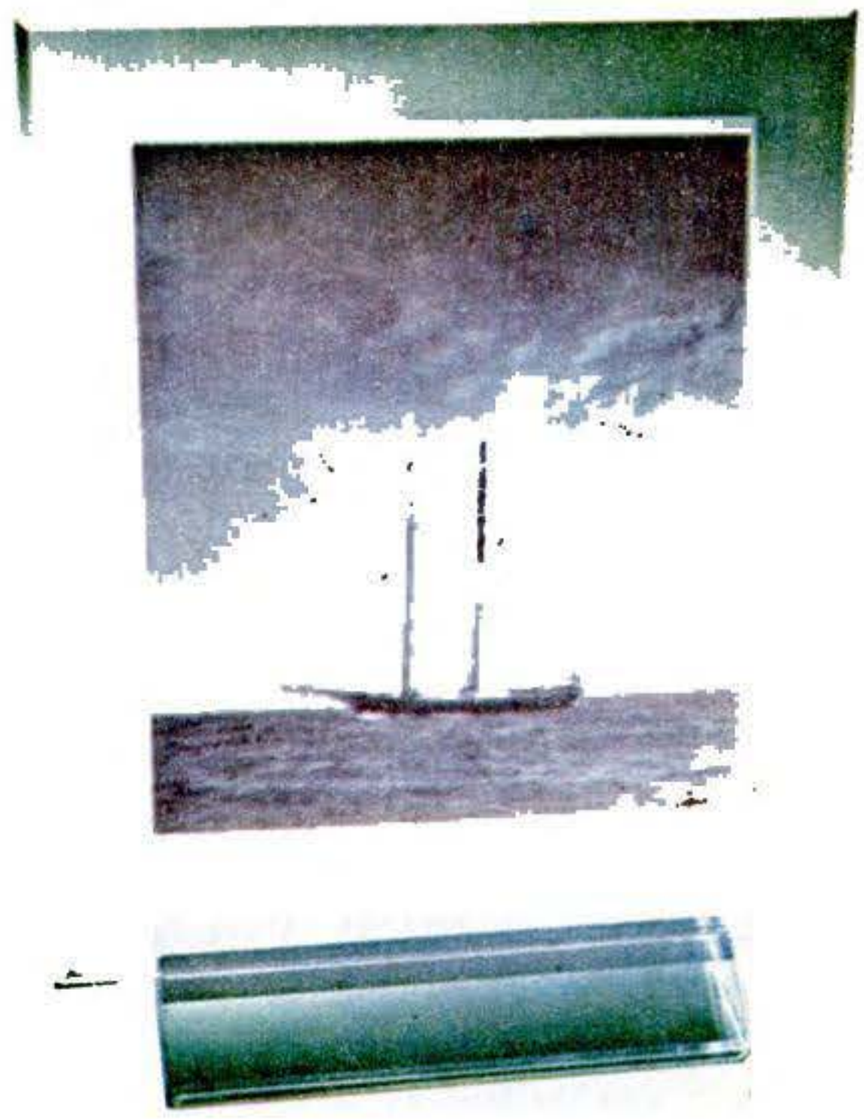
The origin of the new glass goes back to

Copyrighted material

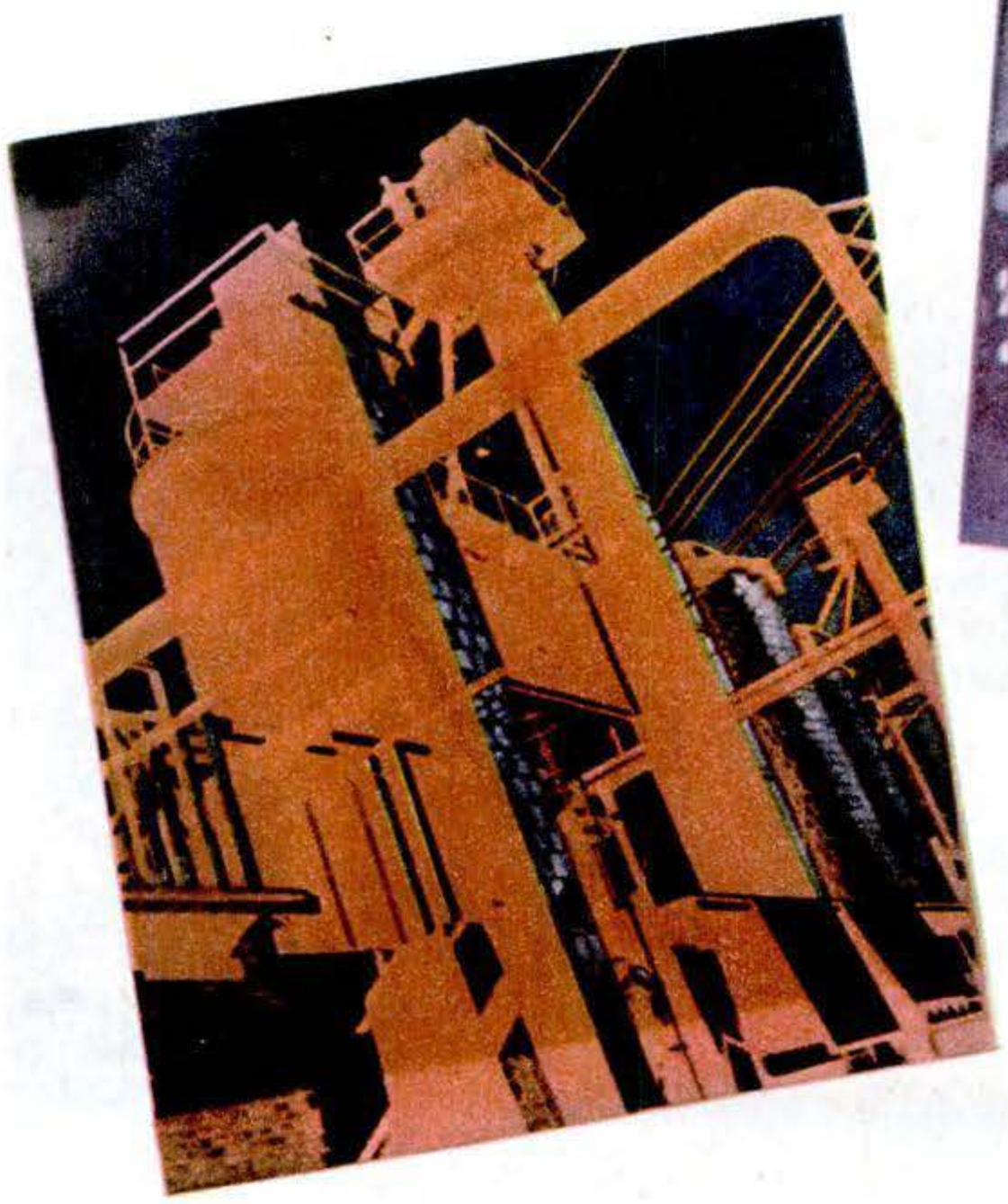
Step wedge shows exactly how pigmentation changes—first blue and then red—and penetrates with increased exposure.

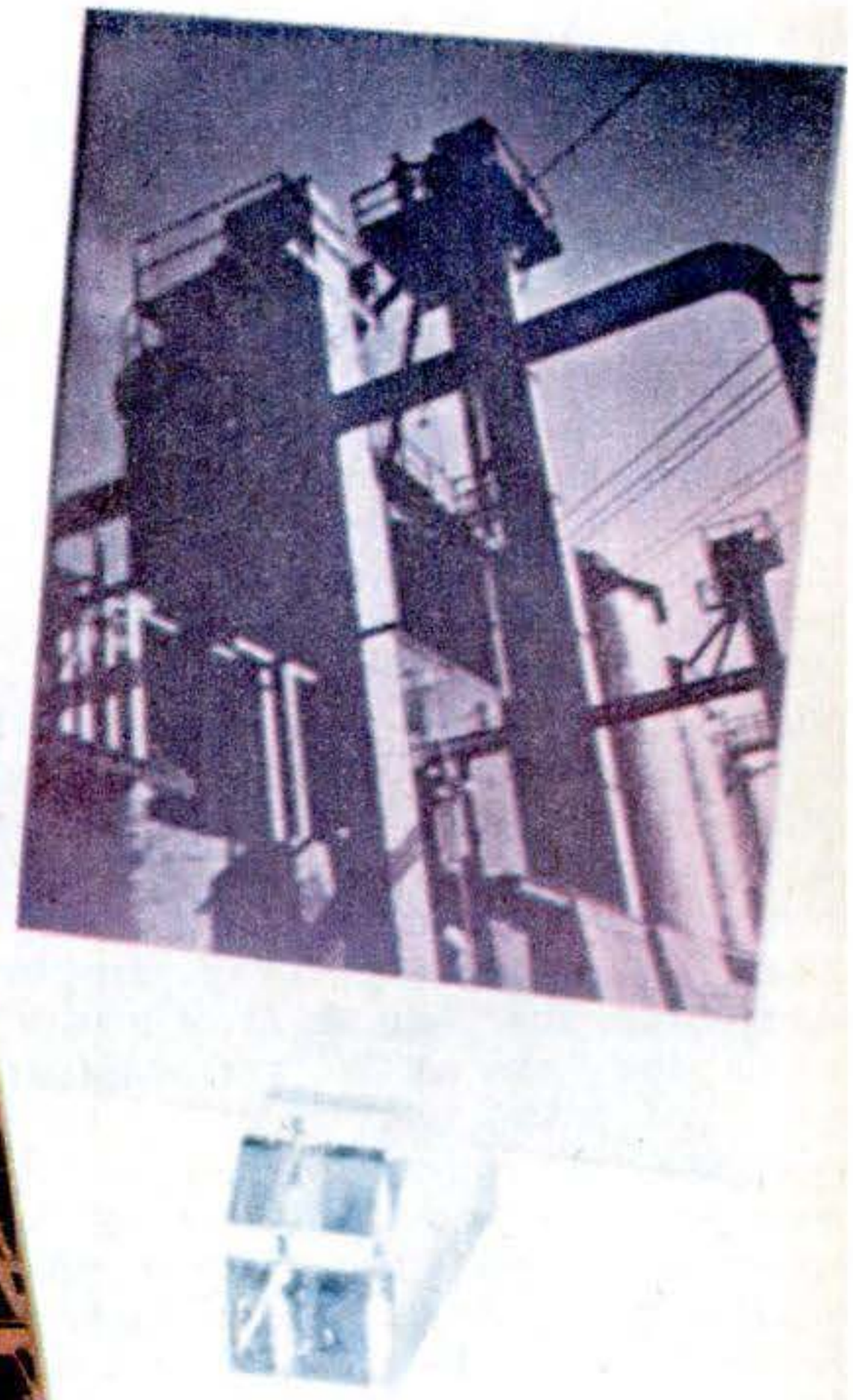


Schooner photo reveals lifelike quality in subtle red overtones of highlights against blue middle tones and shadows.



From the same negative, these glass prints show variations resulting from different exposures. Print at right has red highlights and blue shadows, but longer exposure produced the result at left, with red shadows and blue highlights.





Copyrighted material

To print on glass, it is placed behind an ordinary photographic negative in a printing frame. The procedure is the same as the regular process for printing on paper.

Ultraviolet light makes the exposure. Typical one is 15 minutes at three feet from a 60-ampere carbon arc. Direct sunlight can be used, but it may take all day.

1937 at the Corning laboratory, when Dr. Robert Dalton found that a permanent color difference was produced in ruby glass when it was irradiated with ultraviolet light and then heated.

This suggested the idea of glass that would act like photographic printing paper, on which little particles of silver are precipitated and fixed by light and chemicals to develop the picture. In 1941, after many experiments, Dr. D. S. Stookey found that certain metallic particles could be mixed within glass to reproduce ruby designs in otherwise clear glass.

Soon afterward, the Treasury Department became interested in the glass during a wartime quest for substitutes for metal coins. Treasury officials looked at samples, and were prepared to authorize the manufacture of glass coins. But the enormous quantity needed was beyond Corning's production capacity, so glass money never appeared.

Wartime need for research into other kinds of glass forced a temporary halt in the development of photosensitive glass. But since the war, Dr. Stookey has developed new sensitizers, new colors, increased photographic speed and color intensity.

The tiny metallic particles are everywhere within the glass and are in solution. That is, they are an integral part of the glass. But ultraviolet light makes them precipitate, or come out of solution as something solid and visible. They remain trapped in the glass, however, in precisely the same positions as before. Only ultraviolet light is of the right wave length to affect the particles in this way. Heat fixes the particles and makes the color picture develop. The particles are so fine that the printing is essentially grainless, permitting fine detail without distortion.

If the negative does not cover all the surface of the glass, the remaining portions are masked off with black tape. Thus a small picture or design can be printed on one part of a goblet. The exposure time governs the depth of the picture, and parts of the negative can be exposed longer to create a three-dimensional effect.

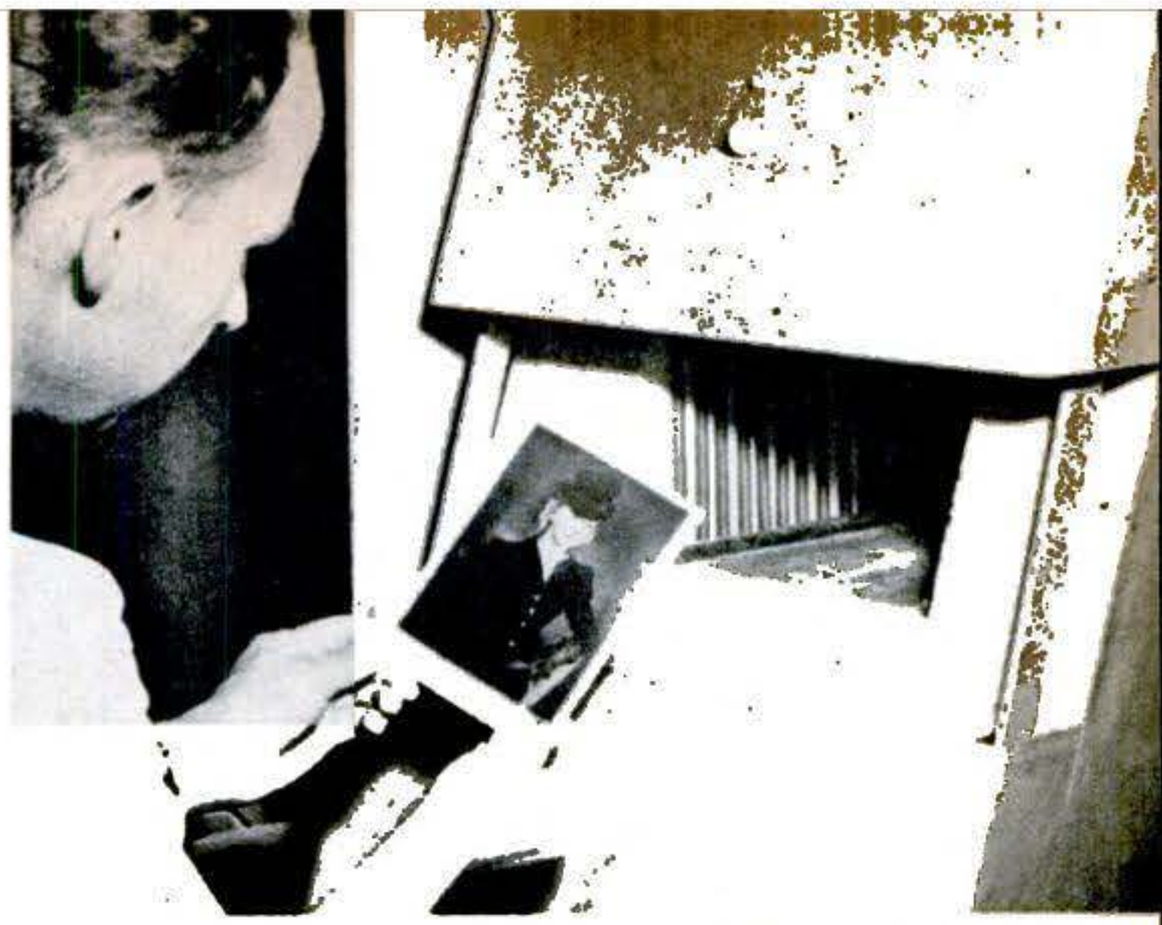
The heating after exposure does not fix all the particles within the glass, but its physical appearance remains unchanged unless it is again subjected to the 1,000° temperature—not likely to happen unless it comes in contact with a raging fire.

One kind of glass, because of its ingredients, takes pictures in blue, purple, ruby or orange, and combinations of these colors. Another prints only in brilliant red. Still another gives pictures in yellow and brown. The shade of color is determined by exposure. In one type, exposure for a

Labels and indicator glasses like these are among first applications of photo-glass. Other possible uses include lighted advertising displays and religious emblems.

Copyrighted material

Glass plate is then put into a furnace and heated to slightly above annealing temperature—about 1,000° F. Once cooled, only reheating it will alter the picture.



When glass is removed from the oven, the image has become an integral part of it. The depth of image penetration is determined by length of ultraviolet exposure.

couple of minutes makes the entire picture red, but portions of it can be made purple by exposing them longer. Shadowed areas penetrate farther into the glass than the high-lighted areas.

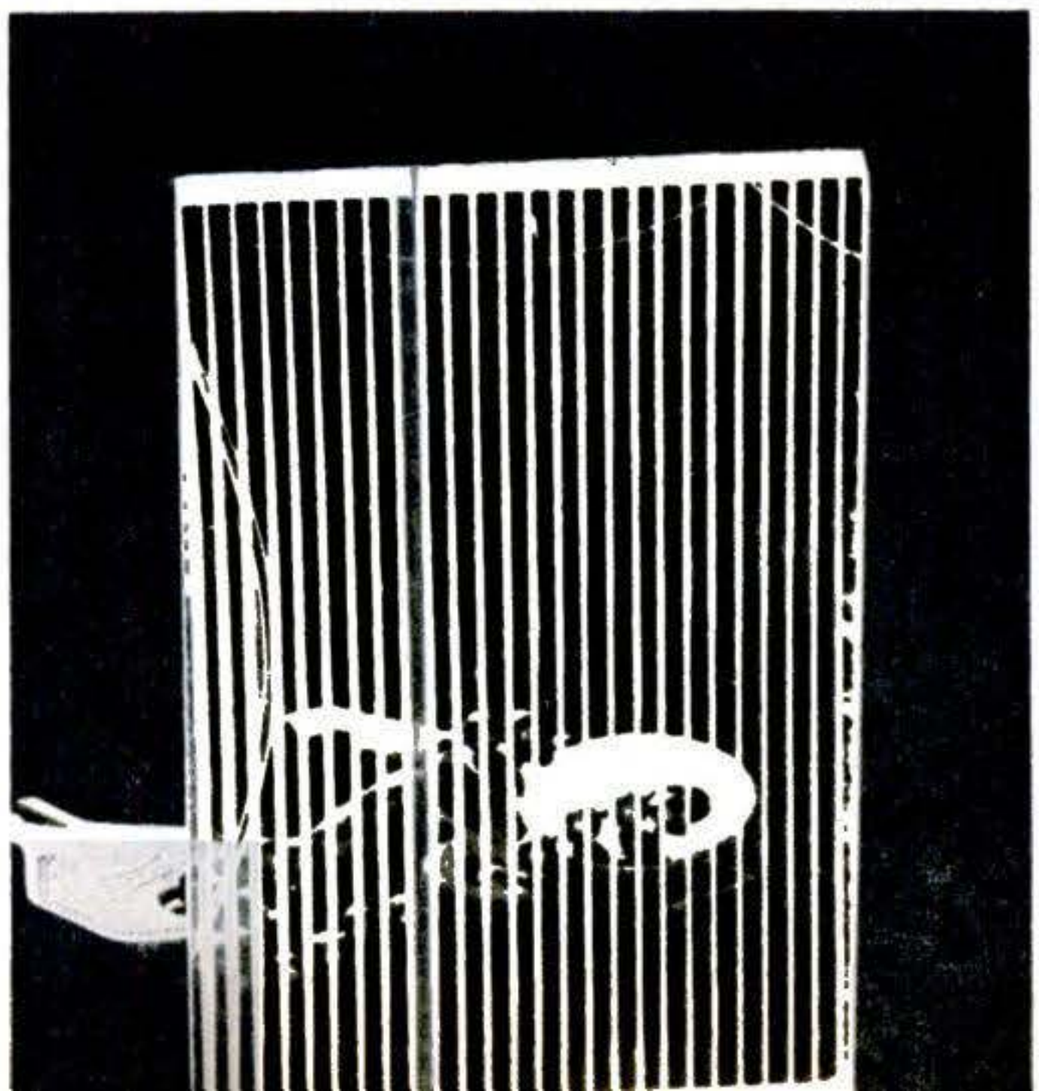
Besides these transparent colors, Corning is making photosensitive opal glass—the white translucent kind used in lighting fixtures to eliminate glare. The opal glass permits printing of three-dimensional designs of microscopic, light-scattering crystals in any pattern in clear glass. These can be red, blue, yellow, brown, or white, and certain combinations of these colors.

Transparent and opal glasses can be combined in designs side by side, or one can be superimposed on the other so that the opal makes a background for a transparent colored image. Ribbons of opal crystals can be extended through a plate of glass like venetian blinds and used in lighting fixtures to direct bright light onto some areas while others are illuminated with soft, diffused light.

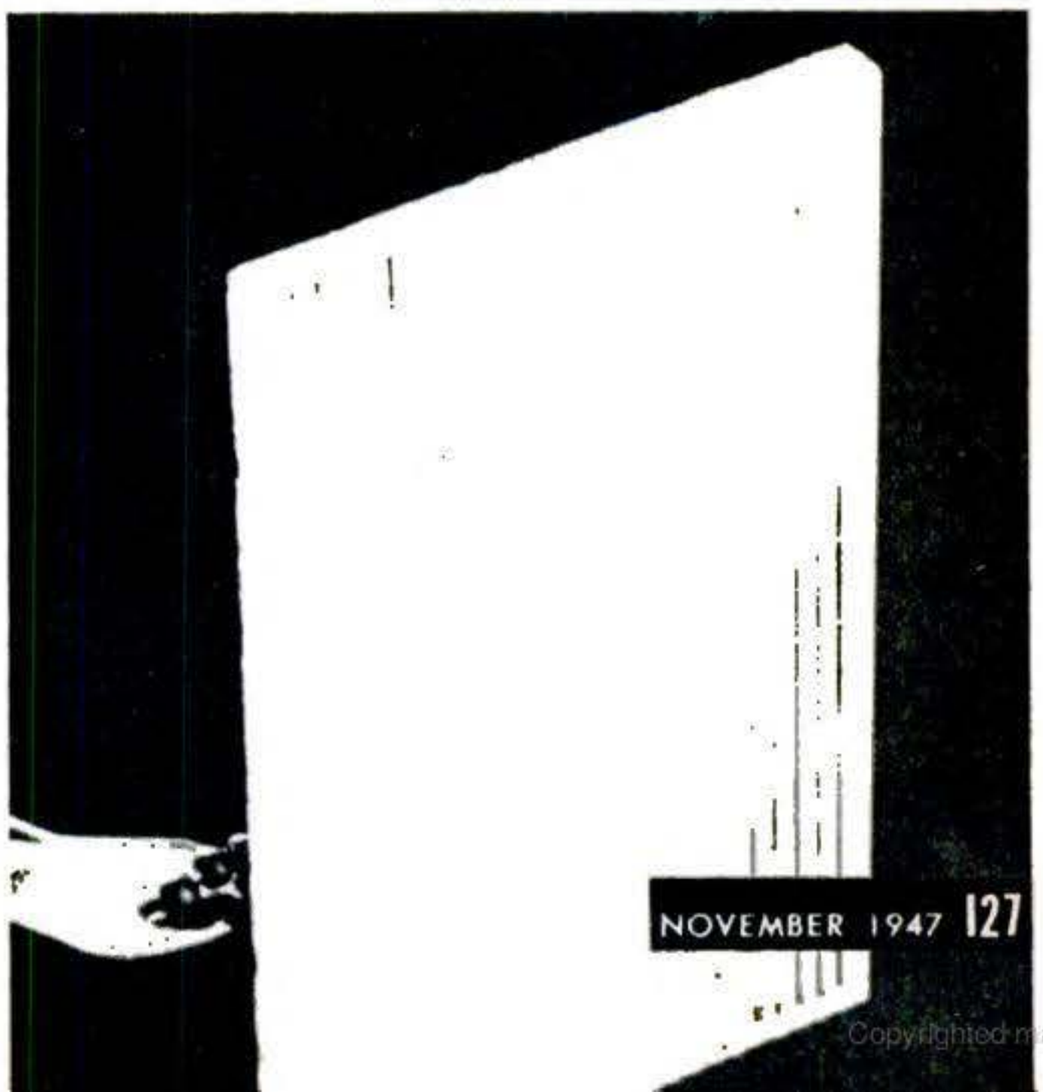
Light placed behind a glass picture enhances its effect. So does etching the back of a piece of the glass. Corning foresees use of the glass for portraits, scenic photographs and miniatures. Other possible applications include goblets, vases and tableware; costume jewelry such as signet rings; church windows, photomurals with or without lighting, and decorative tile; permanent microfilm records, instrument dials that are heat- and scratch-resistant; and lantern slides for projection.

Photo-glass is a new pictorial medium—a December-May marriage of the ancient art of glassmaking and the younger craft of photography. With it, portraits in glass may someday be treasured as family heirlooms—enduring for centuries. END

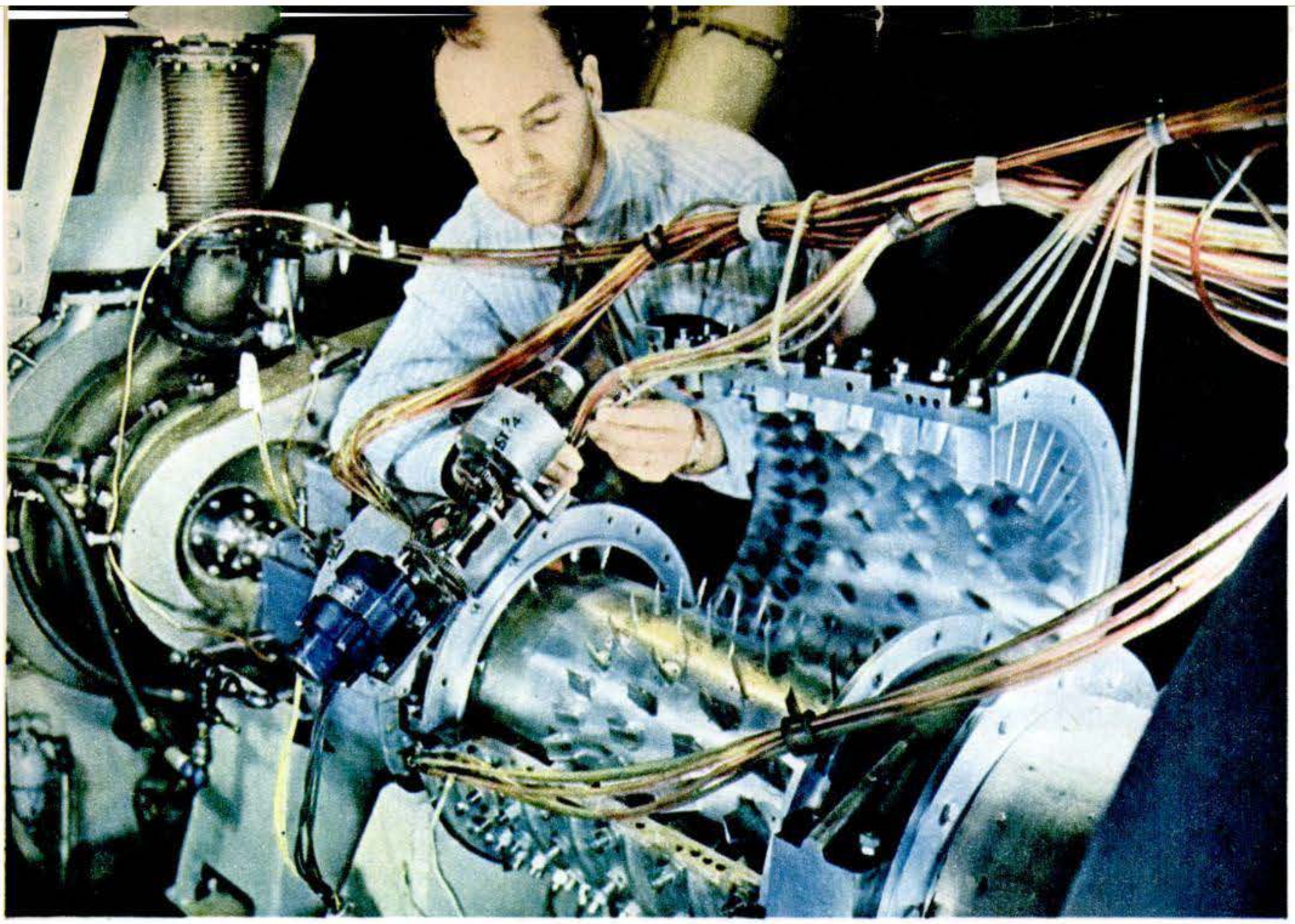
Bands of the opal glass, running through a plate at an angle, can be used for a diffusing glass louver. Seen head-on, parallel to angle of exposure, it is transparent.



But when you look at the louver at an angle, as below, the streaks of opal glass act as a venetian blind, blocking any view of what lies beyond but admitting light.



Copyrighted material



Developing gas turbines of the future, Boeing engineers test new types of compressor blades.

Turbines For Autos?

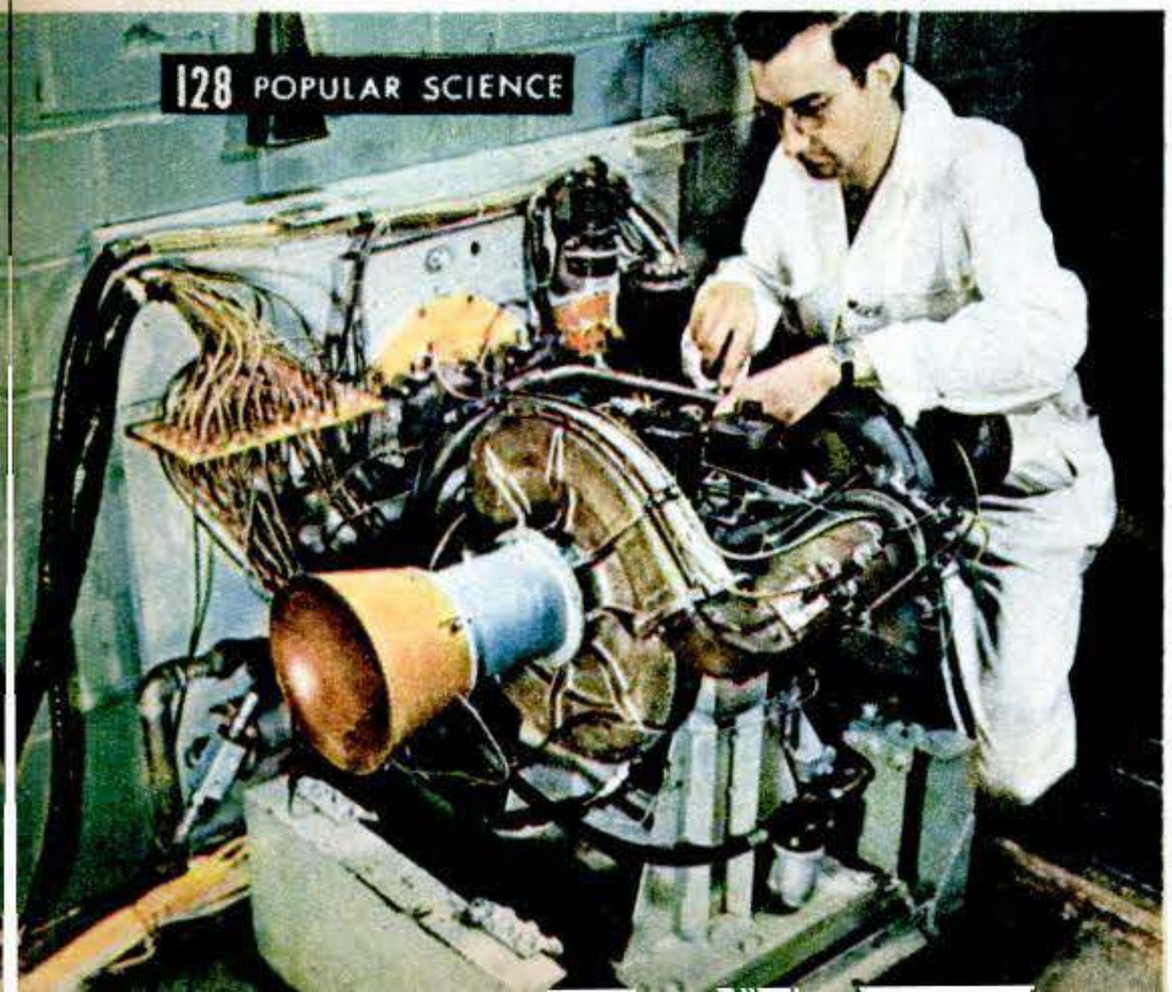
Mighty power of midget models, now becoming available, foreshadows era of new uses for jet power plants.

WILL gas turbines, new standard for military aircraft and the coming thing for civilian planes, drive automobiles next? High horsepower-to-weight ratio afforded by big jet engines interests automotive engineers in new and smaller power packages.

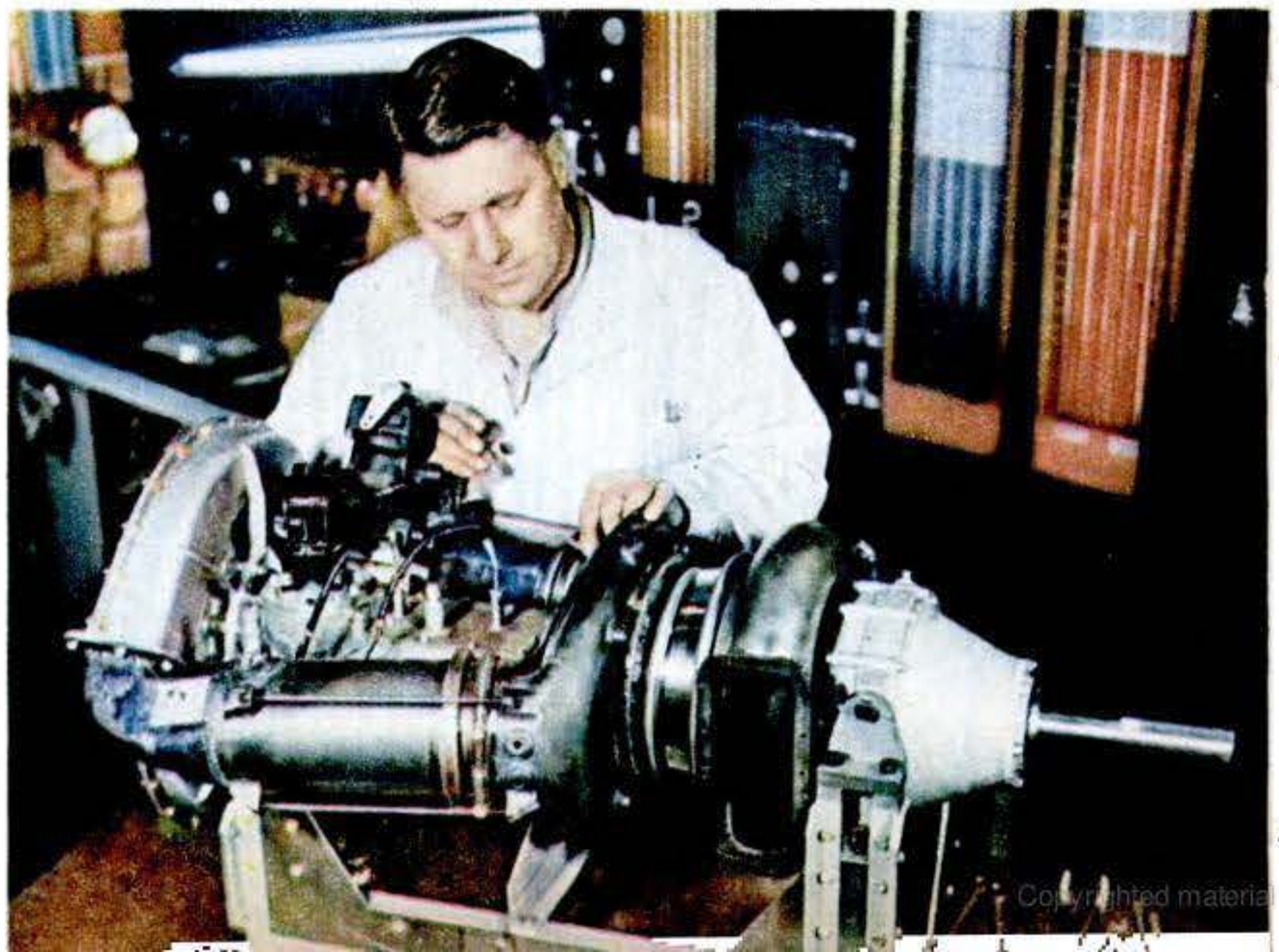
Boeing's Model 500, an 85-pound midget for small planes, furnishes all its power in a jet. But a modified, turboprop version, Model 502, might be a prototype of gas turbines for automobiles, boats and stationary power plants. This 140-pound engine delivers 200 horsepower, double the output of a 500-pound auto engine, to a mechanical drive. Its 7½-inch turbine wheel is turned by twin burners, possible equivalent of cylinders in tomorrow's cars.

Evolution of a gas-turbine automobile will require improved fuel economy, and a means of diverting or eliminating rearward jet exhaust—but neither seems impossible.

Model 500 turbojet engine, weighing only 85 pounds, may prove to be starting point in evolution of gas turbines for motor cars.



Turboprop version, Model 502, weighing 140 pounds, makes the next step by harnessing its 200 horsepower to a mechanical drive.



Copyrighted material

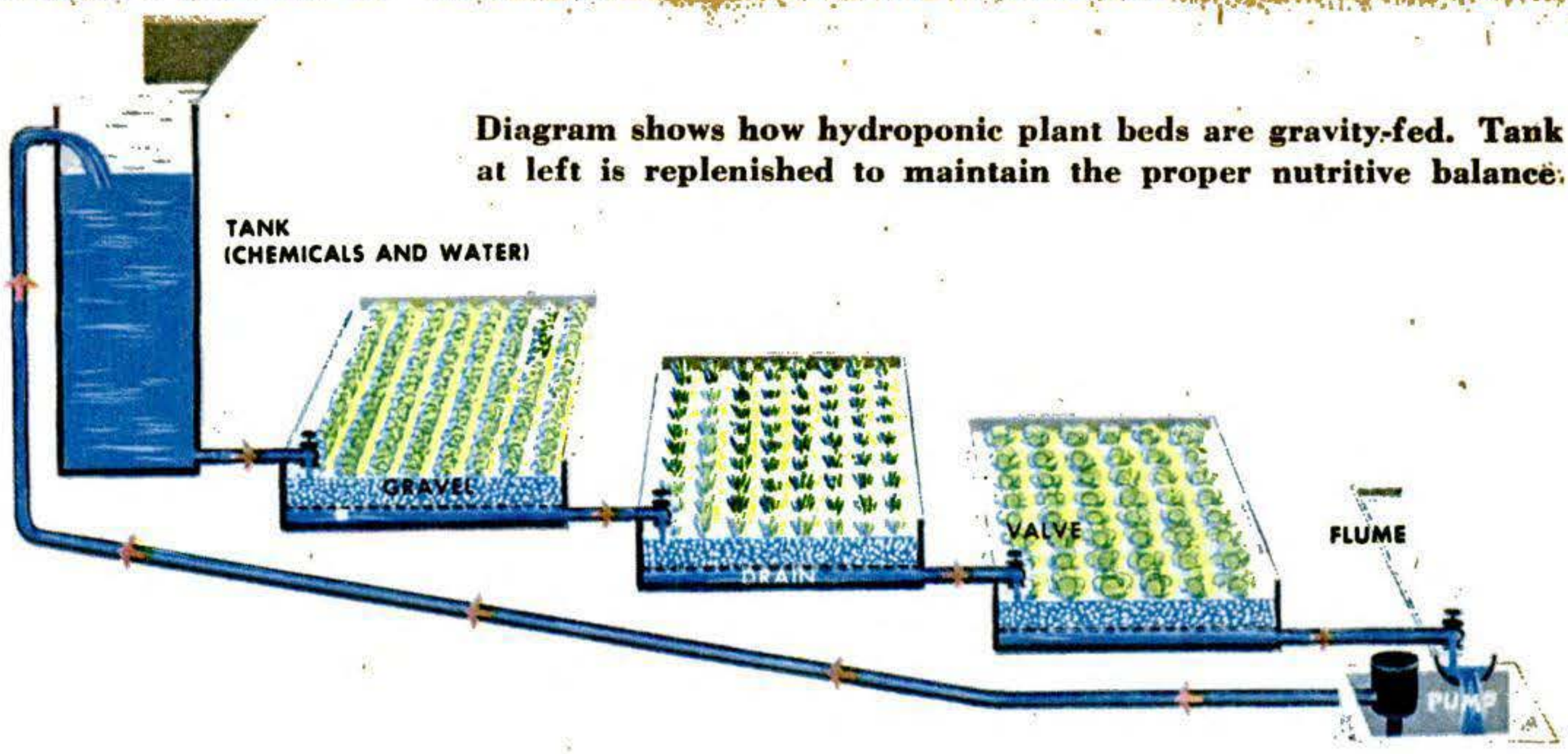


Diagram shows how hydroponic plant beds are gravity-fed. Tank at left is replenished to maintain the proper nutritive balance.

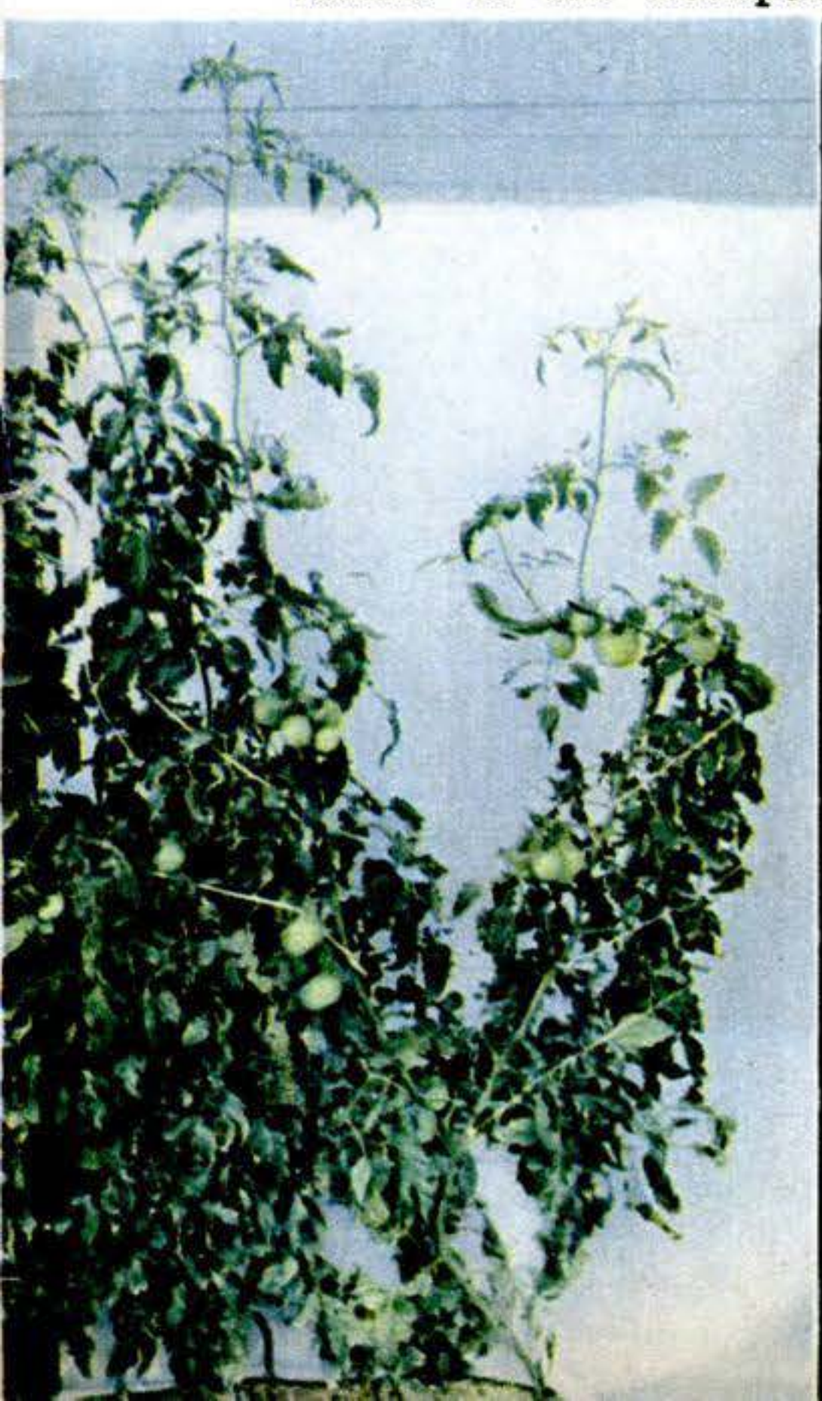
Multitude Fed Without Soil

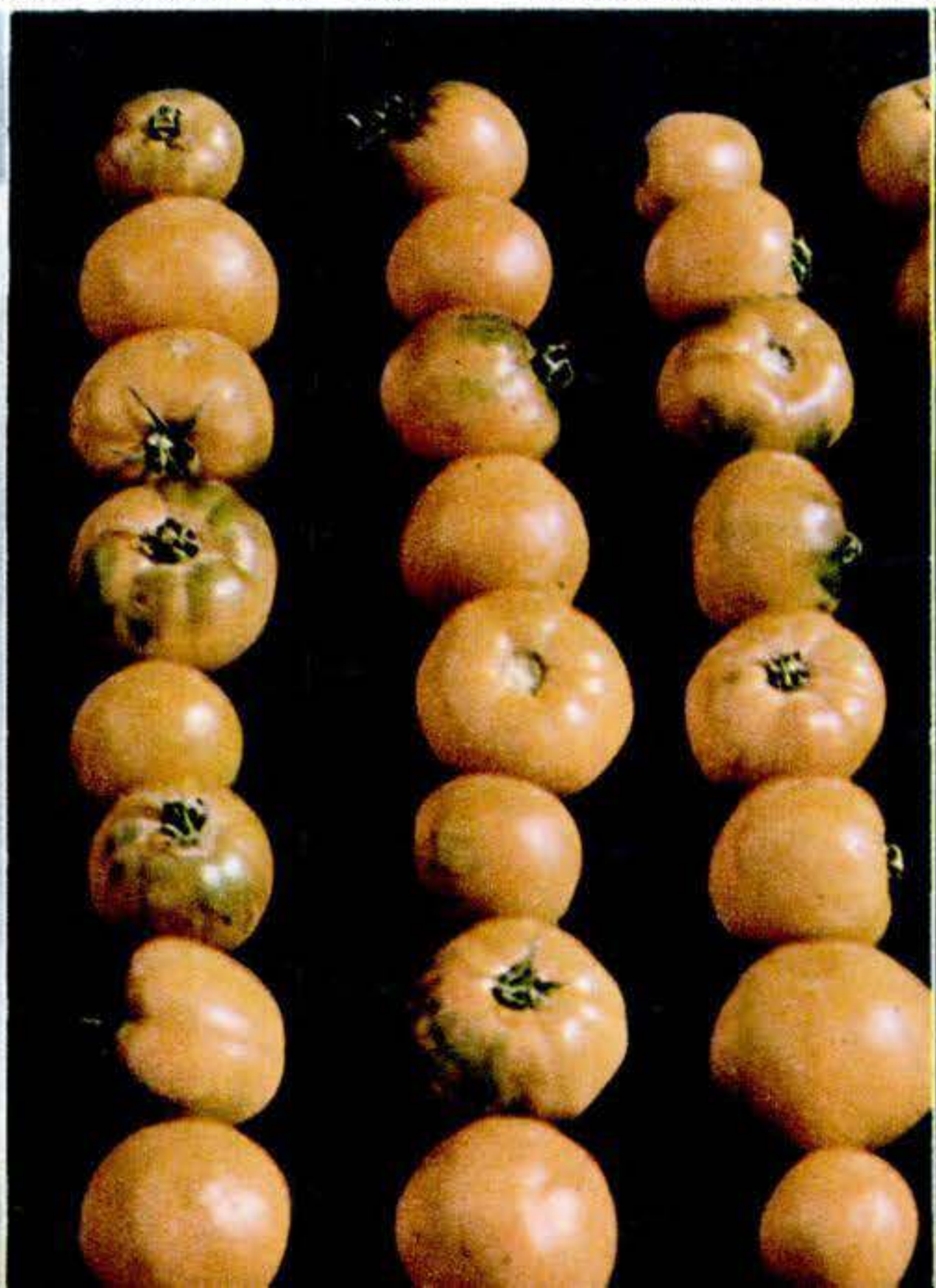
And when it was evening, His disciples came to Him, saying: This is a desert place . . . send the multitude away. . . . But Jesus said unto them: They need not depart, give them to eat. MATT. XIV: 15, 16.

On Ascension Island, Army Air Forces base in the Atlantic Ocean, there was no soil at all, but a multitude was fed fresh vegetables from hydroponic gardens. Now an even greater multitude is being fed the same way. This year, 100,000 men of our occupation forces will get eight salad meals a week from the yield produced by the world's largest soilless farms, covering 80 acres in Japan.

Hydroponic gardens consist of long, shallow troughs of concrete or asphalt-lined wood filled with washed gravel, volcanic cinders, or other inert material in which seeds are placed or small plants set to take root. A gravity system feeds the beds

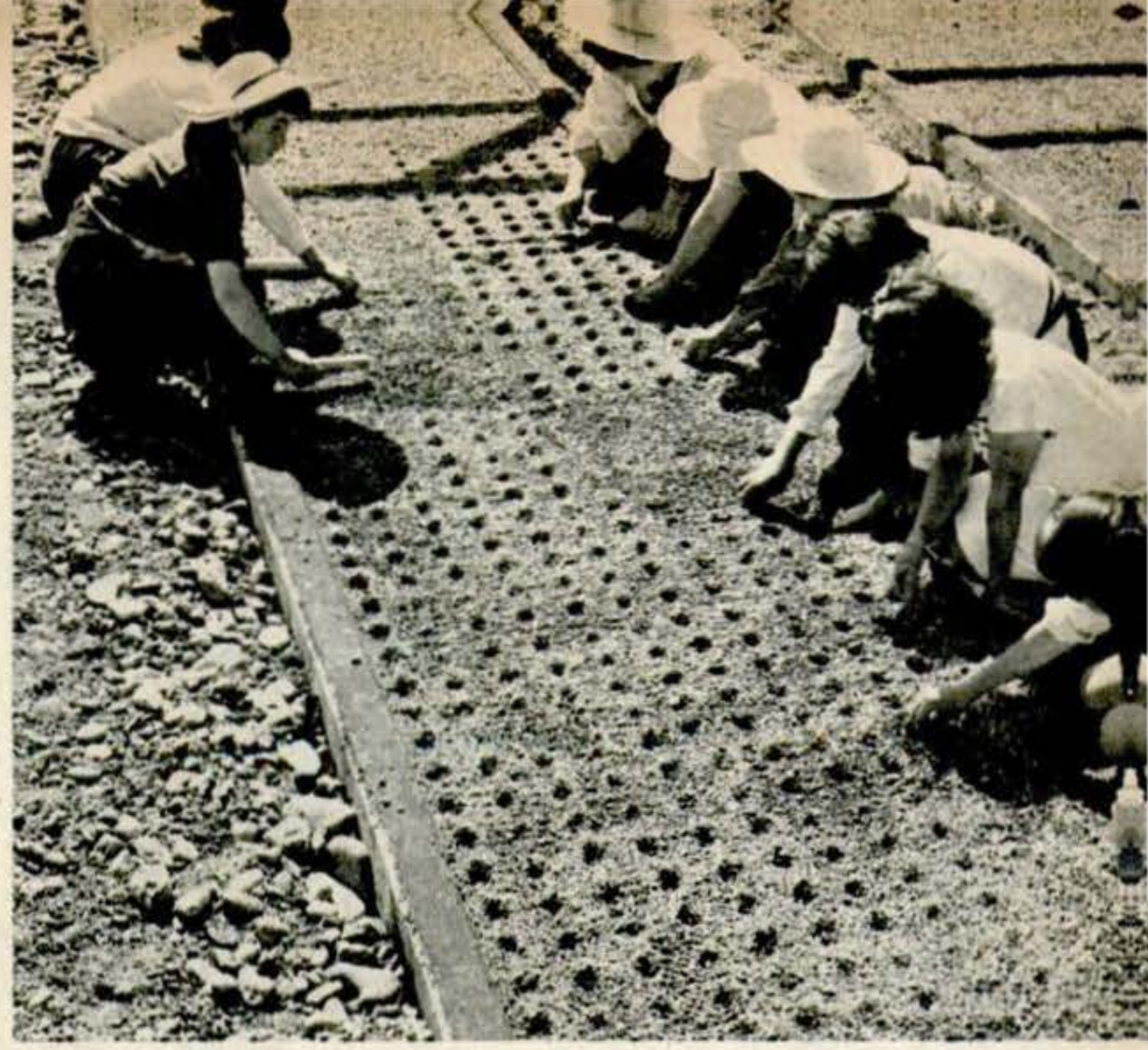
These six-foot tomato plants, hydroponically grown, will add 1,000 tons of health to the meals of our occupation forces in Japan this year. To the right of the tomatoes is a prime bunch of celery; its clean roots have never been near the earth.





Copyrighted material

Beds are fed several times a day with a chemical solution, which drains into flume and then is pumped back to the supply tank.



Japanese girls seeding beds of the Army's hydroponic farm at Chofu, near Tokyo, Japan. This farm covers 55 acres.

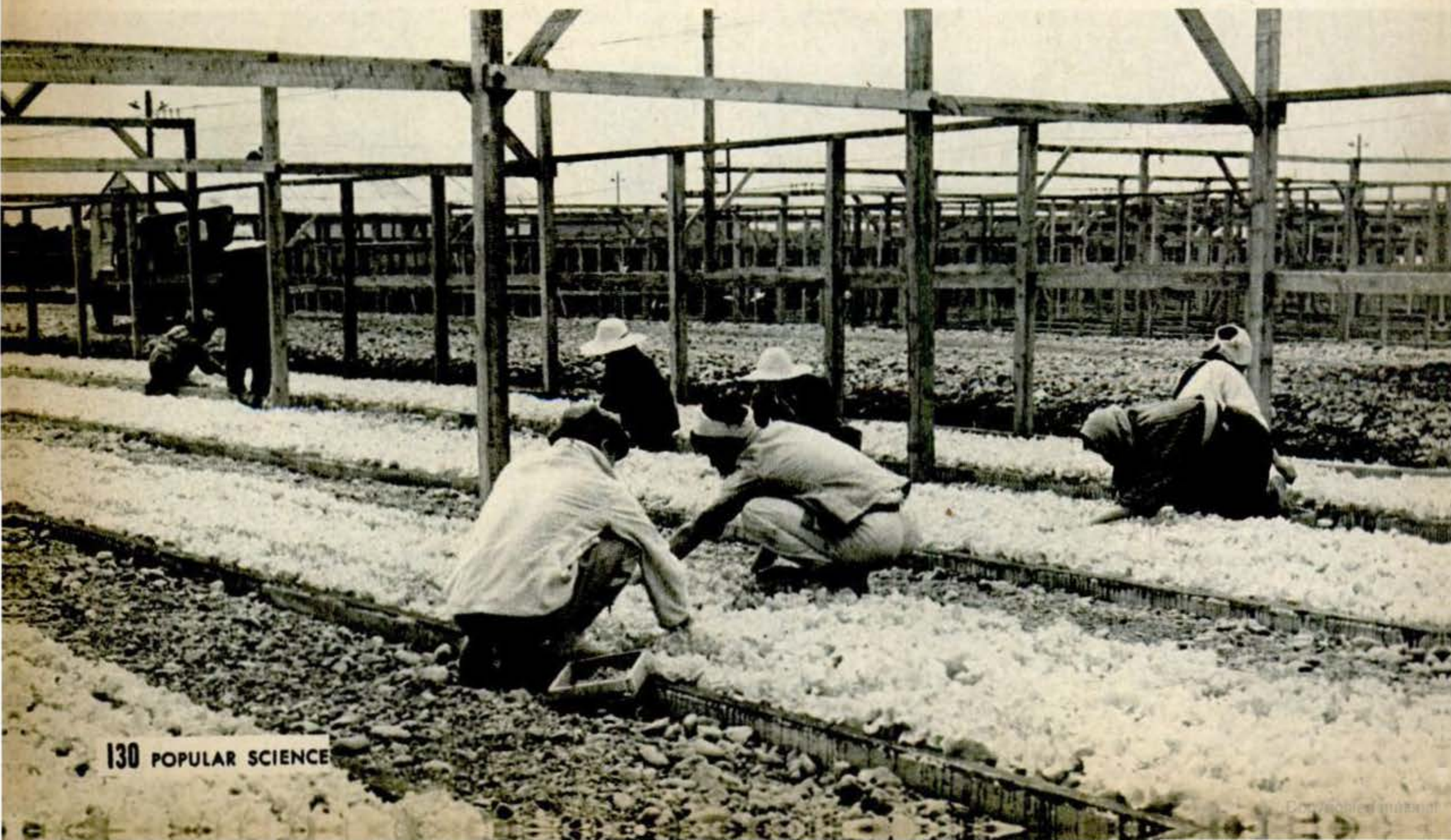
with a chemical solution needed for growth.

But it's an expensive business in dollars and cents when compared with commercial soil-grown vegetable market prices. Therefore the Army, the only agency that has had large-scale, out-of-the-laboratory experience with hydroponics, sets strict limitations for its use.

The chief restriction is that hydroponics should be used only where there is no soil, as is the case on volcanic islands and desert locations, or where the soil, through the use of human fertilizer (as in Japan and China), is unfit for the growth of vegetables that are eaten raw. Vegetables that are cooked before eating can be obtained much more cheaply in canned, frozen or dehydrated form.

Despite its limitations, the Army's war-born experience has proved that hydroponics is practicable on a large scale. Further experience and experiments will undoubtedly tailor the chemical garden to peacetime needs. END

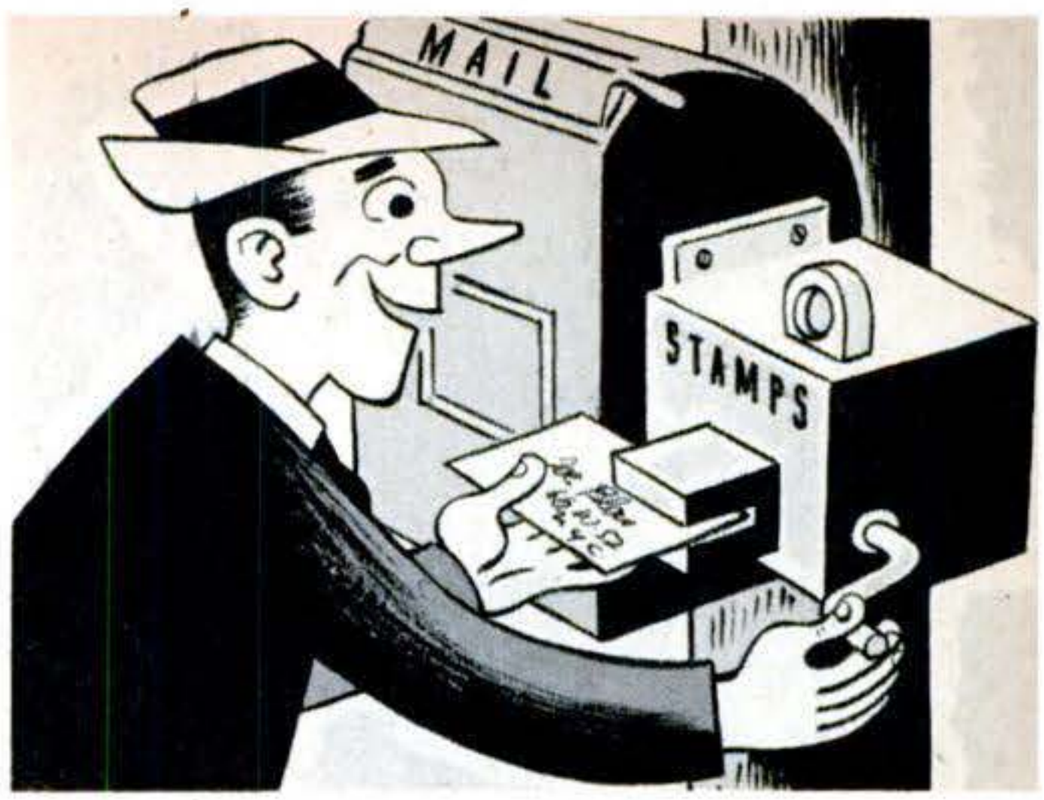
Rich chemical solution makes plenty of work for weeders in this 30-day-old lettuce patch.



I'd like to see them make . . .

Cartoons by Syd Landi

Everybody has his own pet idea of some gadget he would like to see in general use. What is YOURS? *Popular Science Monthly* will pay $5.00 for every such suggestion that it accepts for publication. Contributions cannot be acknowledged or returned.



Mailbox Stamp Dispensers. Coin-operated postage stamp venders attached to all mailboxes on street corners would save many weary steps to the postoffice, declares Henry Hupka, of South Bend, Ind.

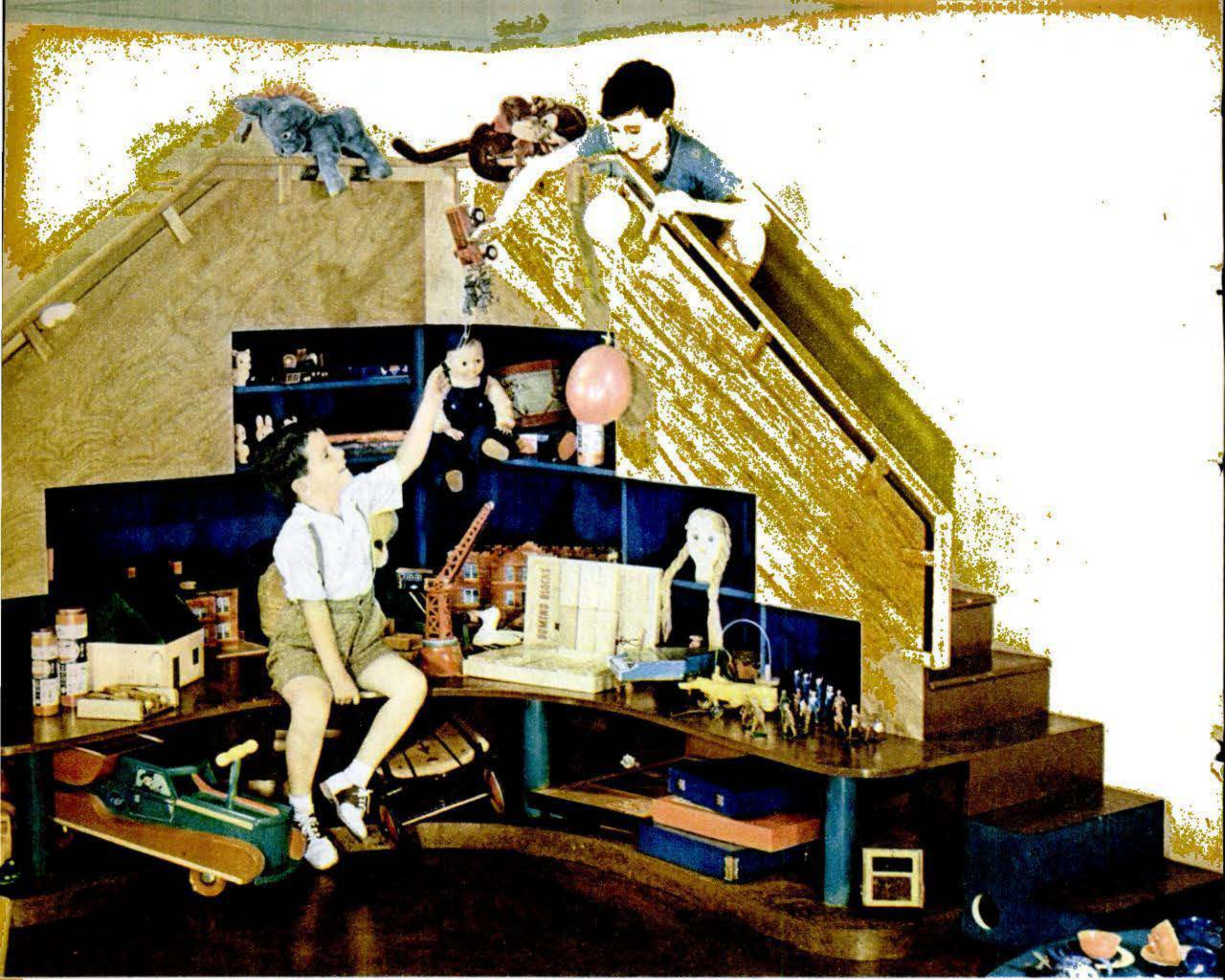
Heated Steering Wheel. To warm the hands of those who prefer to drive in winter without gloves, Mrs. John Hallacy, of Joplin, Mo., would like to see heating coils embedded in the steering wheel.

Built-In Dirt Collector. A removable bucket, concealed beneath the floor of each room by a foot-operated trap door, would avoid stooping to reach the dirt, asserts Mrs. L. A. Kerat, of Seattle, Wash.

R. R. Safety Signal. A second light of a different color to signal the approach of another train after one has already passed a crossing would reduce accidents, says George A. Budd, of Clearfield, Utah.

Noncramping Crib. An adjustable crib that can be enlarged as the baby grows would save space and eliminate the extra expense of a regular bed, points out Mrs. Anna Mitchell, of the Bronx, N. Y.

Copyrighted material



One side of the double stairway, which leads nowhere but up and down, can be converted into a slide. The wide, elevated play shelf keeps the children off the floor and out of the way of drafts; it also serves as a roof for the garage space provided underneath.

Toys and Ideas Fill Kids' Rumpus Room

A MODEL playroom—a child's dream world from floor to ceiling—has been designed by architect Joseph Aronson for the American Toy Institute, research division of Toy Manufacturers of U.S.A., Inc.

The idea of the 12- by 18-foot model room is to get the most out of maximum play area in minimum space in a way that the average home owner can duplicate, either in a whole room or in a corner of a bedroom. The model emphasizes elevated play areas and ample, easy-to-reach toy-storage space. A linoleum floor with inlaid patterns avoids the splinter hazard and doubles as a hopscotch field. Dust-catching decorations and sharp corners are eliminated, and bright colors add the finishing touch.

Copyrighted material

The train table, supported by a plywood desk, is a hinged door that folds up against the wall to cover the shelves on which rolling stock may be safely stored. A door in the hollow desk (seen at left) goes nowhere, but creates a hideaway "cave."

As modern as the playroom itself is the special children's furniture, also designed by Mr. Aronson. The plywood shelves, in a variety of heights and widths, help simplify the task of teaching youngsters how to be tidy with their playthings.

Signal Corps' New Tricks

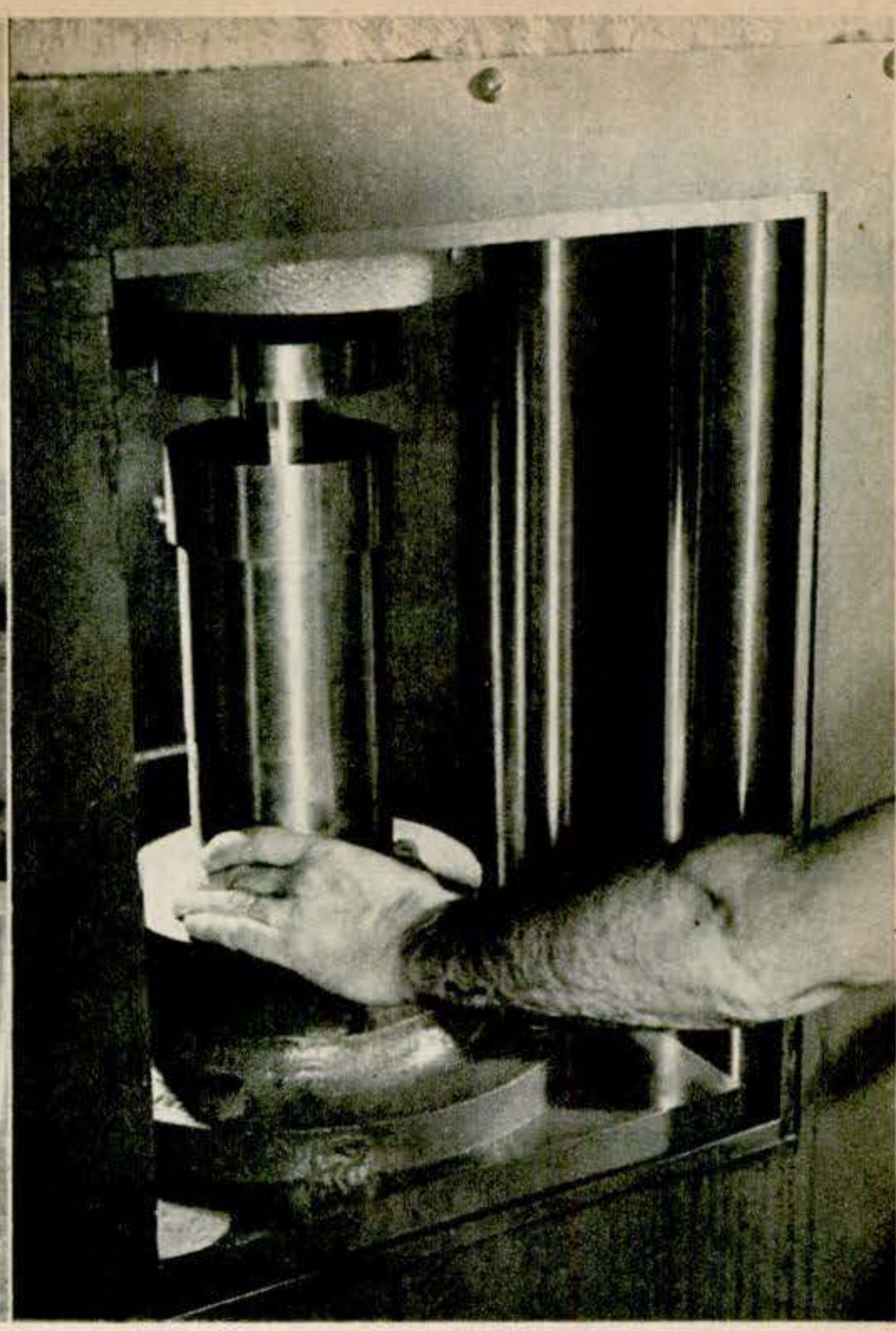
PSM photos by Hubert Luckett

Improving Nazi Radar. The Army Signal Corps has big plans for this huge "Wurzburger" radar, built by the Germans. At the Evans Signal Laboratory, Belmar, N. J., the parabolic antenna will be replaced by an even larger one to shoot signals to the moon. A "bedspring" antenna made the first moon contact (PSM, Mar. '46, p. 93).

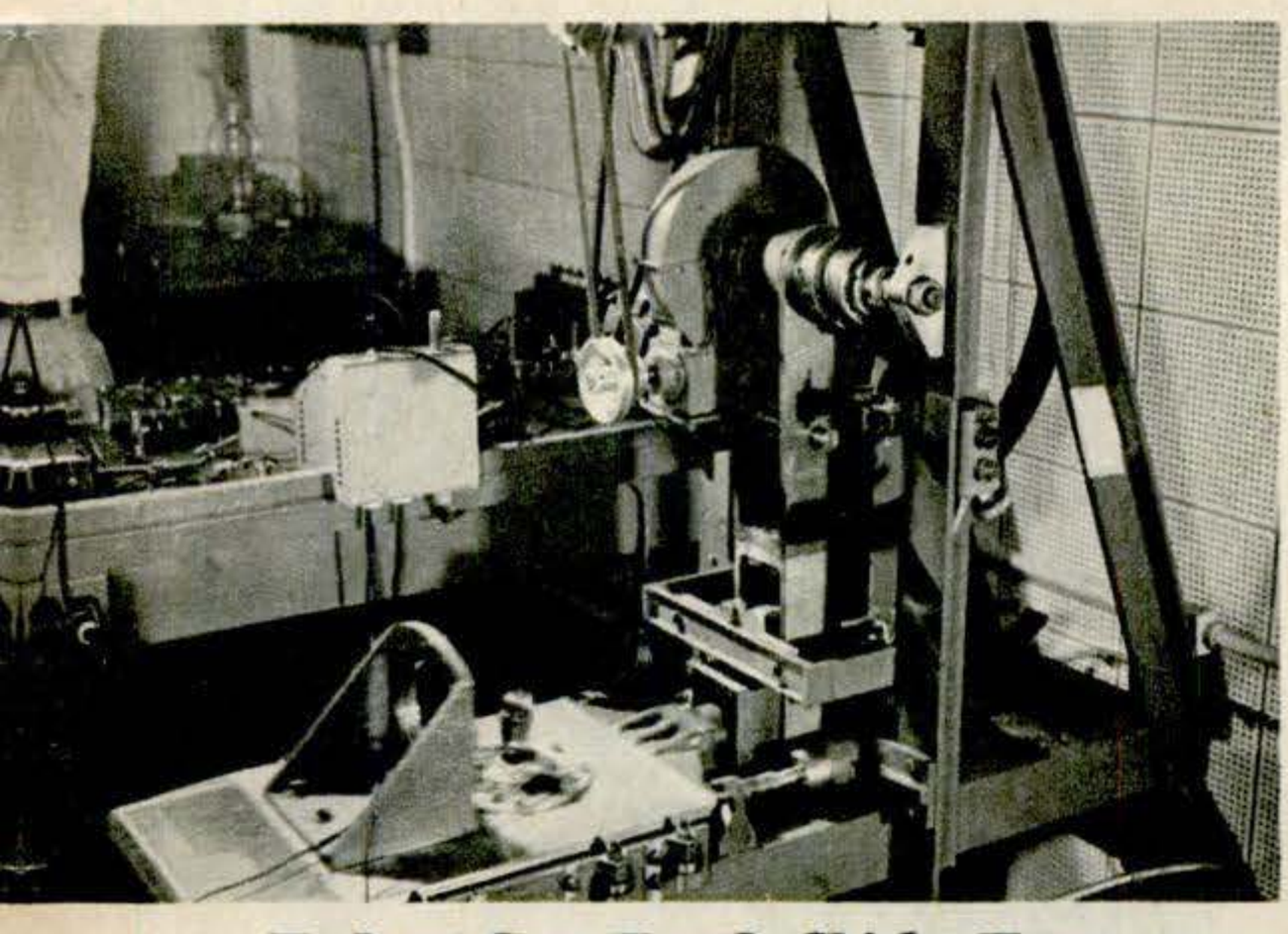
Plastic Aids Tube Surgery. This thyratron tube has been cut in half, but thanks to a plastic the delicate parts are safe. The Signal Corps uses the sections to show how the tube works. The specimen is first dunked in molten methyl methacrylate (lucite) and punctured. The vacuum inside the tube quickly sucks in the plastic. When the lucite hardens, the tube can be sawed lengthwise.

Ack-Ack Accuracy. This apparatus tells a gunner just how close he came to the target. Two microphones, each with its own transmitter, are mounted in a target towed by a plane. The two microphones each pick up the shell's shock wave and transmit it to ground receivers. Computers use the time lag between the signals to figure how far off target the missile was. (Direct hits, naturally, are disastrous.)

Copyrighted material



Stamping Magnetron Parts. Anodes for the magnetrons that generate radar pulses can be turned out cheaply with a new process, in which a die in a 300-ton hydraulic press stamps slots in a copper blank. Photo at left: blanks before and after stamping, die between them. At right, jig with blank and die is put in press.



Tubes Get Tank-Ride Test. This heavy hammer slams a 6Y6-G amplifier tube to see how long it could take a rough tank ride. Note the blurring as the tube recoils under the impact of a force a thousand times that of gravity. Testing machines are essential to Signal Corps research into the durability of war material. This machine is one of the testers in a soundproof room at Evans Laboratory.

Radar Tracks Down Mortars. This portable radar set is Johnny-on-the-Spot in finding enemy mortar batteries. The operator sits at the scope in the trailer, behind a parabolic antenna that automatically scans the sky. The radar picks up a mortar shell in flight at two points on its course. Then an electric computer figures out the complete trajectory and tells where the gun is placed.

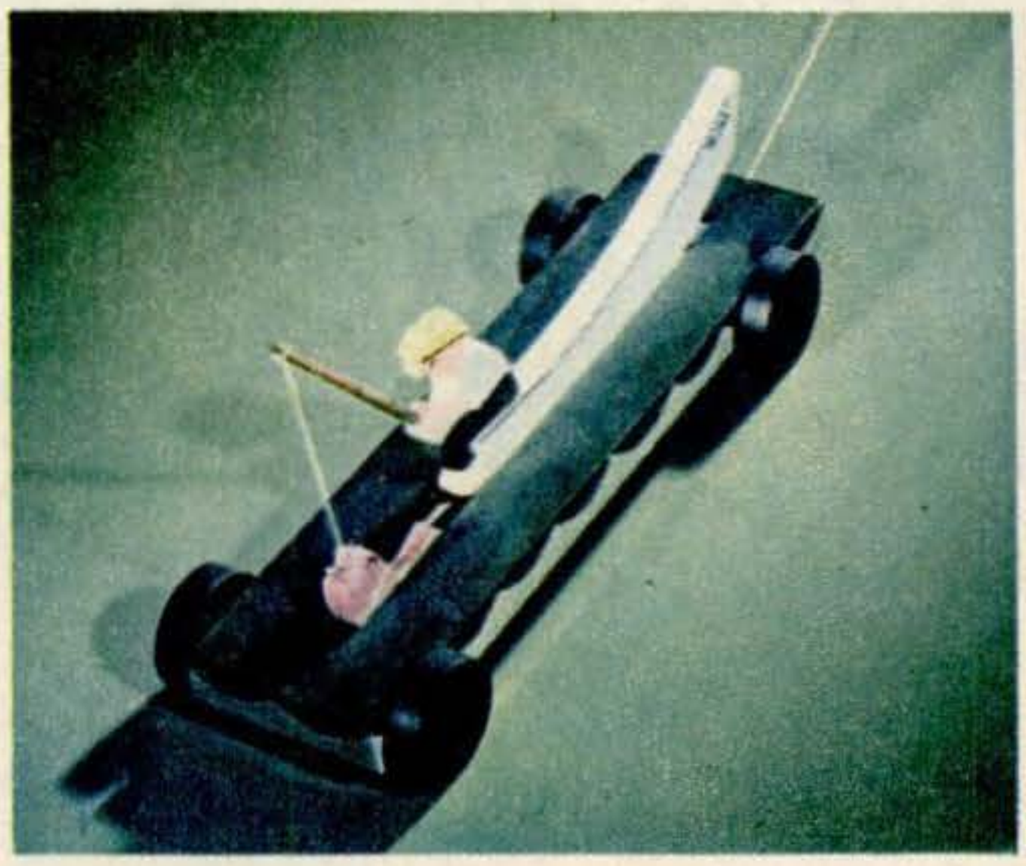
Copyrighted material

CRAFTWORK

PROJECTS OF THE MONTH

Wandering earrings will stay closer to home if you make your wife this "tree" for her dressing table. If she clips her earrings to the lucite leaves that sprout from the duralumin trunk, there's less chance one will be lost, and she'll also find it easier to pick out just the right pair to go with her ensemble. See page 169 for plans.

Serve it to music. When you pick up this handsome hardwood bonbon dish, a tiny music-box mechanism concealed inside tinkles out a pretty tune. Put it down and it stops. You'll find drawings and construction details of this lathe turning on page 180.



An energetic angler bobs up and down for as long as your youngster draws on the cord of this unusual pull toy. A cam on one axle does the trick. It's a simple shop project, and one that toddlers will go for. Page 174 gives how-to-make dope.

Copyrighted material

New Typewriter Conquers Chinese Symbols

FOR the first time since the development of modern Chinese script more than 16 centuries ago, a way has been found to copy quickly all of the language's thousands of complex characters. It is the unique "Mingkwai" (clear and quick) typewriter, invented by Lin Yutang, Chinese author.

Reducing a day's hand copying to an hour's typing, the electrically driven machine can print 90,000 characters and reproduce every known Chinese word. Chinese writing does not use the letters of an alphabet; instead, each word is an individual symbol. Other Chinese typewriters require memorizing the position of 5,000 characters and filling in missing words by hand.

A simple, "self-evident" keyboard, the result of 30 years' research, is the secret of Mr. Lin's typewriter. Perhaps even more important than the typewriter itself is the adaptability of the system to typesetting and teletype machines.

The keyboard has 72 keys: 36 representing the top and 28 the bottom sections of Chinese characters, plus eight printing keys. Pressing a top and a bottom key brings the type roller into position to print a "unit" of eight possible combinations of the basic sections—eight different words.

At the same time, duplicate cylinders bring a replica of this unit to where it can be seen by the typist through a "magic viewer" window. He then selects a character by pressing the corresponding key. This turns and shifts the type roller into position and prints the character.

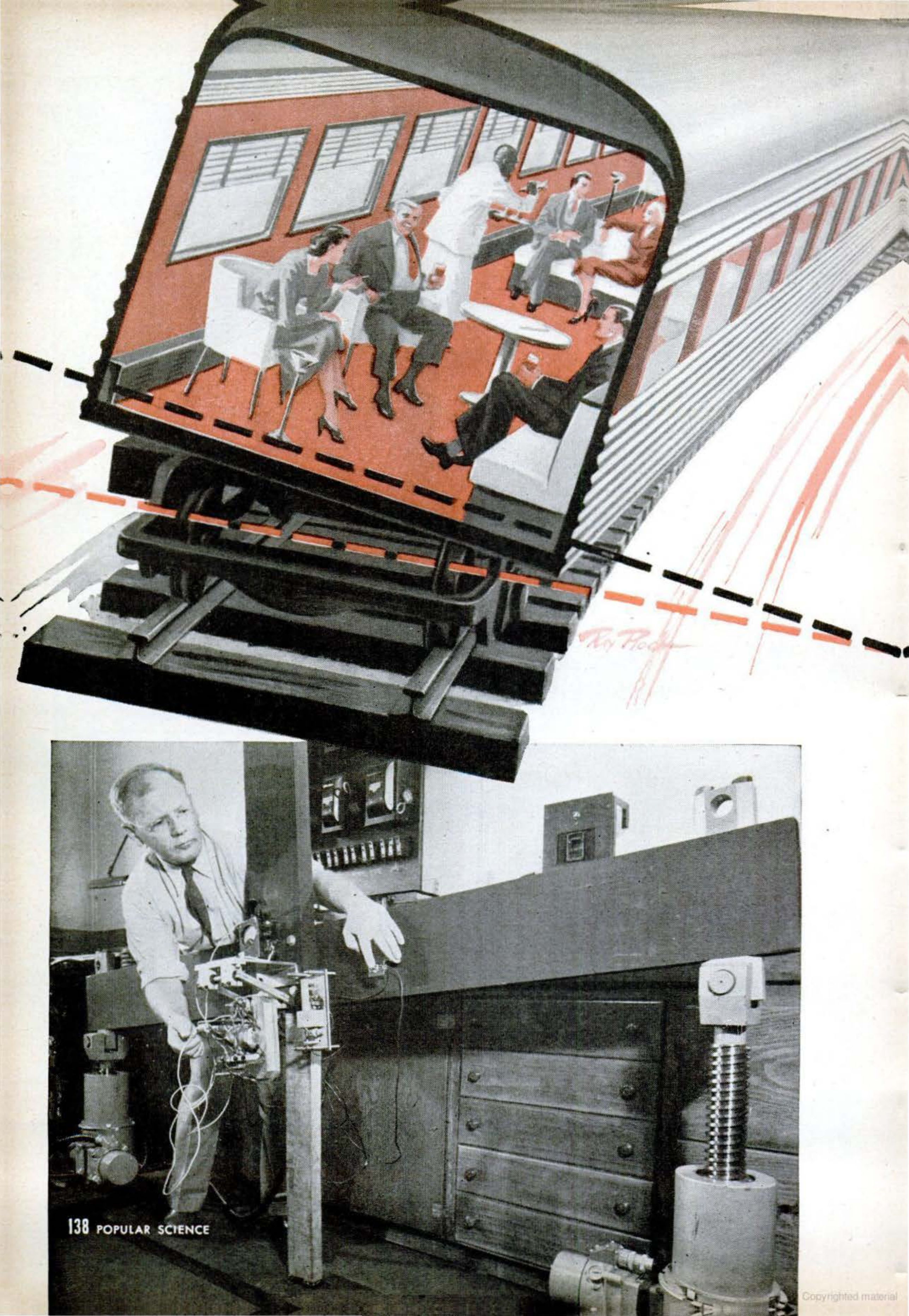
The printing mechanism consists of six cylinders, each having six type rollers that contain 7,000 complete characters and over 1,400 components. Additional words up to a theoretical 90,000 are formed by typing combinations, such as sun+moon, which means "clear." All the characters are duplicated on the six "viewing" cylinders.

Designed for Chinese, the machine can also be used for writing English, Russian, and Japanese by pressing keys that shift into printing position type rollers of faces of the desired language. It types vertical columns, so that when English is used, the typescript has to be turned sideways.

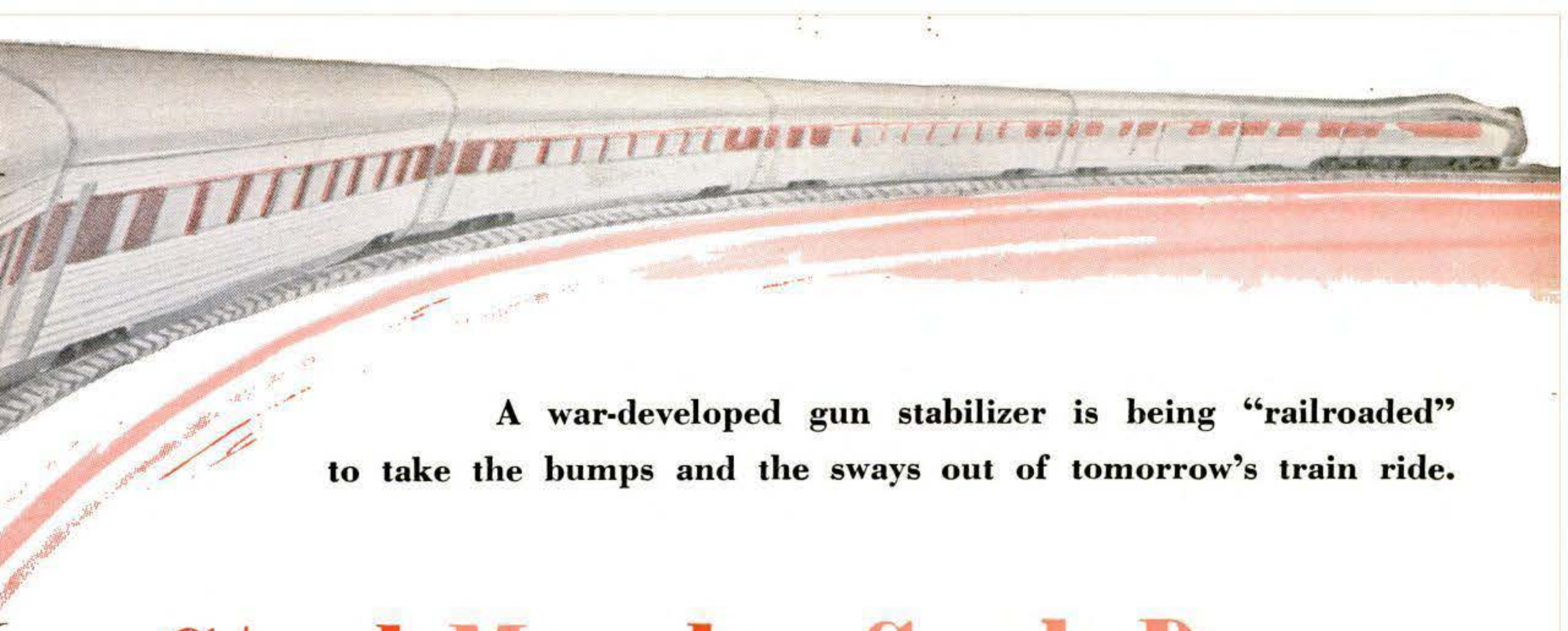
The "Mingkwai," no larger than standard typewriter, has extension on top to accommodate paper for vertical-column typing. "Magic viewer" is seen protruding above the keyboard.

Upper cylinders contain the 36 type rollers. Below them are the smaller hexagonal "viewing" cylinders. Simplified keyboard eliminates memorizing the position of thousands of characters and permits use of touch system for speed typing. White keys at the bottom are the eight printing keys. Operation can be mastered in only a few minutes' instruction.

Copyrighted material



Copyrighted material



A war-developed gun stabilizer is being "railroaded" to take the bumps and the sways out of tomorrow's train ride.

Steel Muscles Snub Bumps On Newest Trains

YOU won't be tossed around when you ride a train fitted with a new automatic "ride smoother." You won't feel the bumps. And your coffee will stay level in your cup even if the engineer takes a curve too fast. Automatic screw jacks will tilt the car's body just enough to provide the right amount of bank.

This "educated shock absorber" for railroad cars is the newest brain child of Dr. Clinton R. Hanna, of Westinghouse, and stems from his tank-gun stabilizer that was used in World War II (PSM, Sept. '44, p. 82). In developing the car stabilizer, Dr. Hanna was assisted by Stanley J. Mikina and Lawrence R. Lynn. Already thoroughly laboratory-tested, the system is now about to be track-tested on an actual railroad car, and a variation is to be tried on large buses.

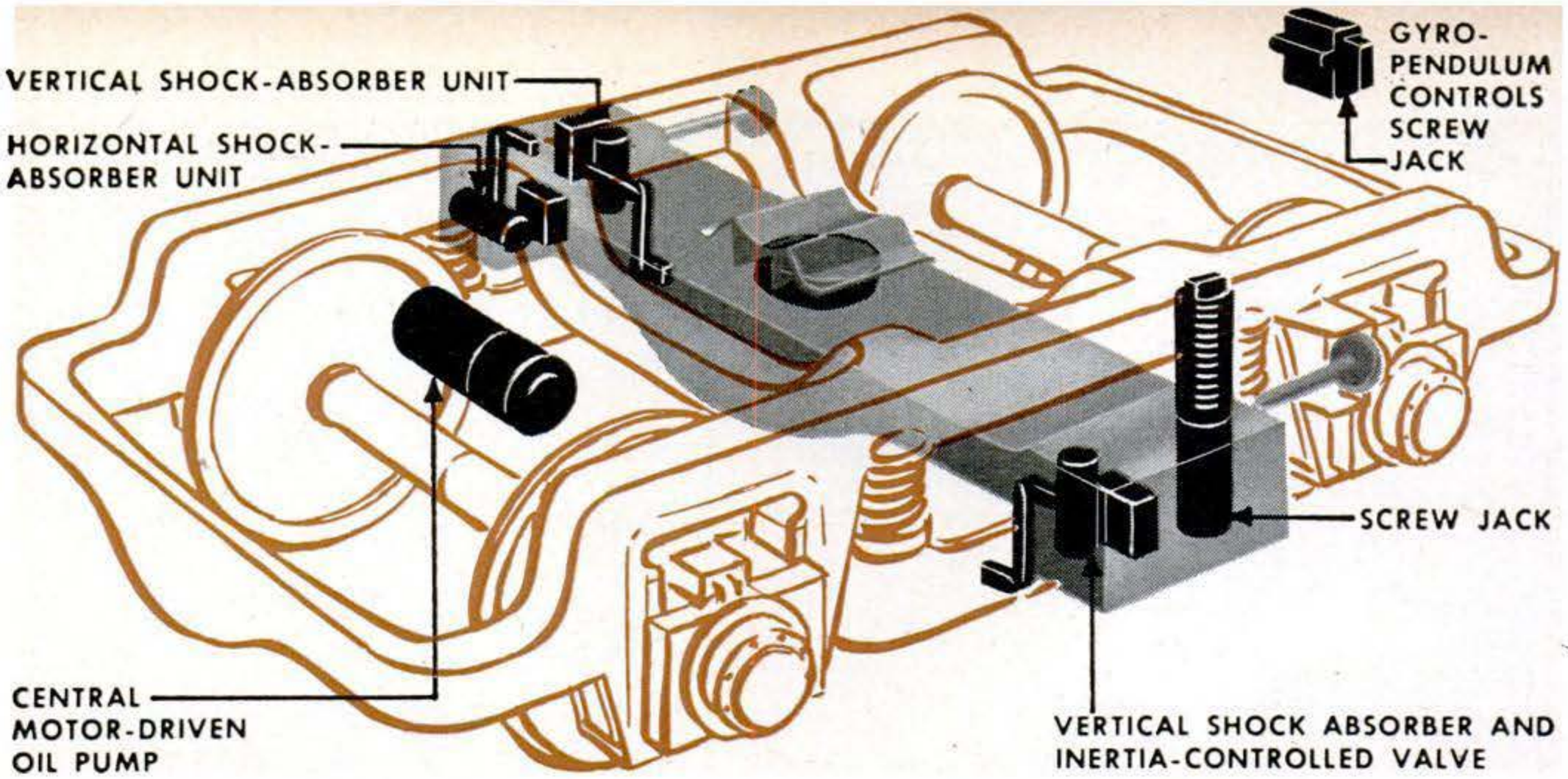
The shock-absorbing system, capable of ironing out better than 60 percent of the bumps and sidesway, operates hydraulically and is controlled by a series of almost-human mechanical brains. Each of the two trucks on the railroad car is fitted with three automatic hydraulic shock-absorbing units. Two take care of bumps and dips; the third controls sidesway.

The operating mechanism in each of these units is a hydraulic cylinder fitted with a double-acting piston that can be moved either one way or the other, depending on how oil pressure is applied. The cylinder in each case is fastened to the portion of the truck that supports the car body, while the piston is linked to the main portions of the truck that moves with the axles and wheels. Each end of each cylinder is connected by piping—Dr. Hanna calls it "plumbing"—to a central, continuously operating, motor-driven oil pump by way of an independent inertia-controlled valve.

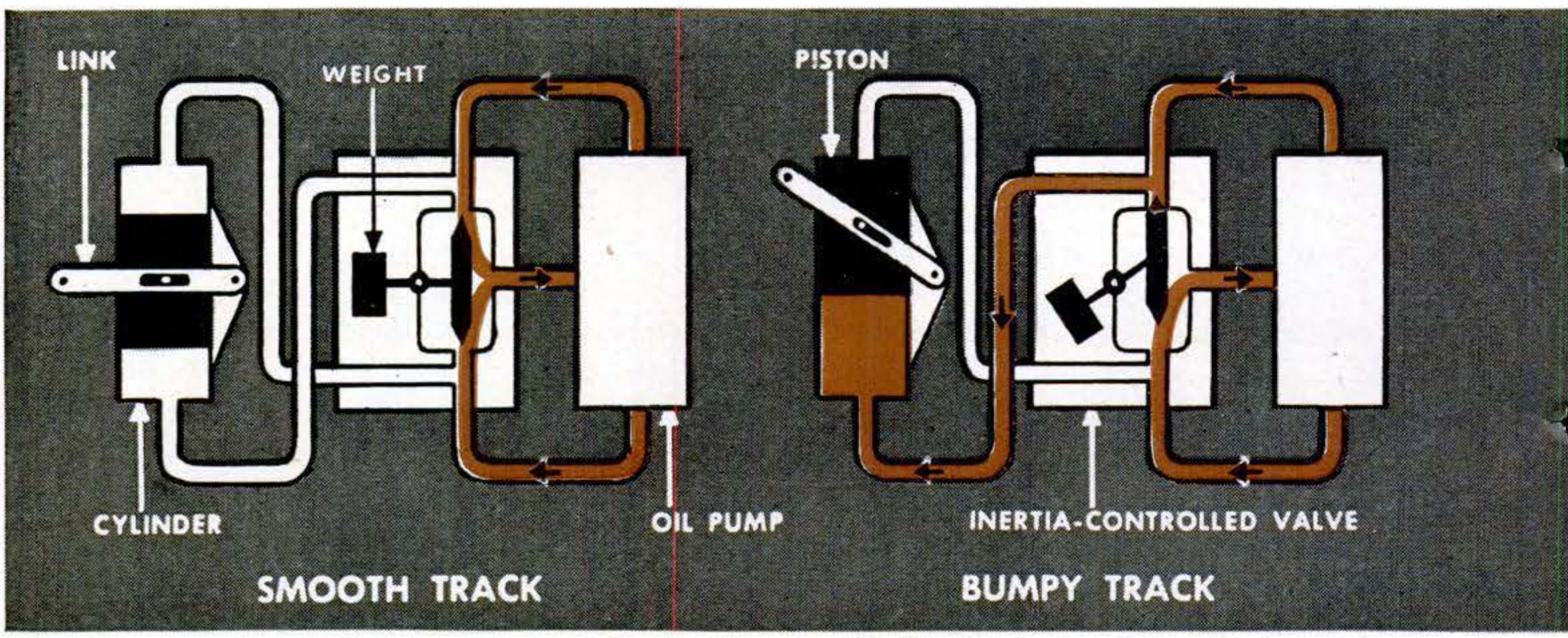
This unit is the "brain" of each shock absorber. It consists of a sensitively balanced weight and arm connected to two valves in such a way that any movement of the weight opens one valve and closes the other. Thus, the slightest movements of the weight, caused by movements of the truck, control the flow of oil from the pump to that particular shock absorber, routing it to the proper end of the absorber's cylinder to force the piston just the right amount in the

Going around sharp curves at high speed can be comfortable with new "tilt regulator," which tips railroad car inward exactly enough to compensate for outward pull of centrifugal force, as shown at top of page. Westinghouse engineer at left is demonstrating pendulum mechanism activating motors and screw jacks that tilt car a fraction of a second after entering a curve.

Copyrighted material



Anticipating movement, three absorbers on each truck as shown above make corrections—up or down, to right or left—within 3/1,000 second. The gyro-pendulum, a separate unit, controls motor-driven screw jacks that tilt the car to compensate for bank on curves.



When the car hits a bump, inertia tends to hold the weight down, which closes the upper valve and routes oil under pressure to the bottom of the shock-absorber cylinder. This forces the piston and link up to lift the wheels enough to counteract the unevenness.

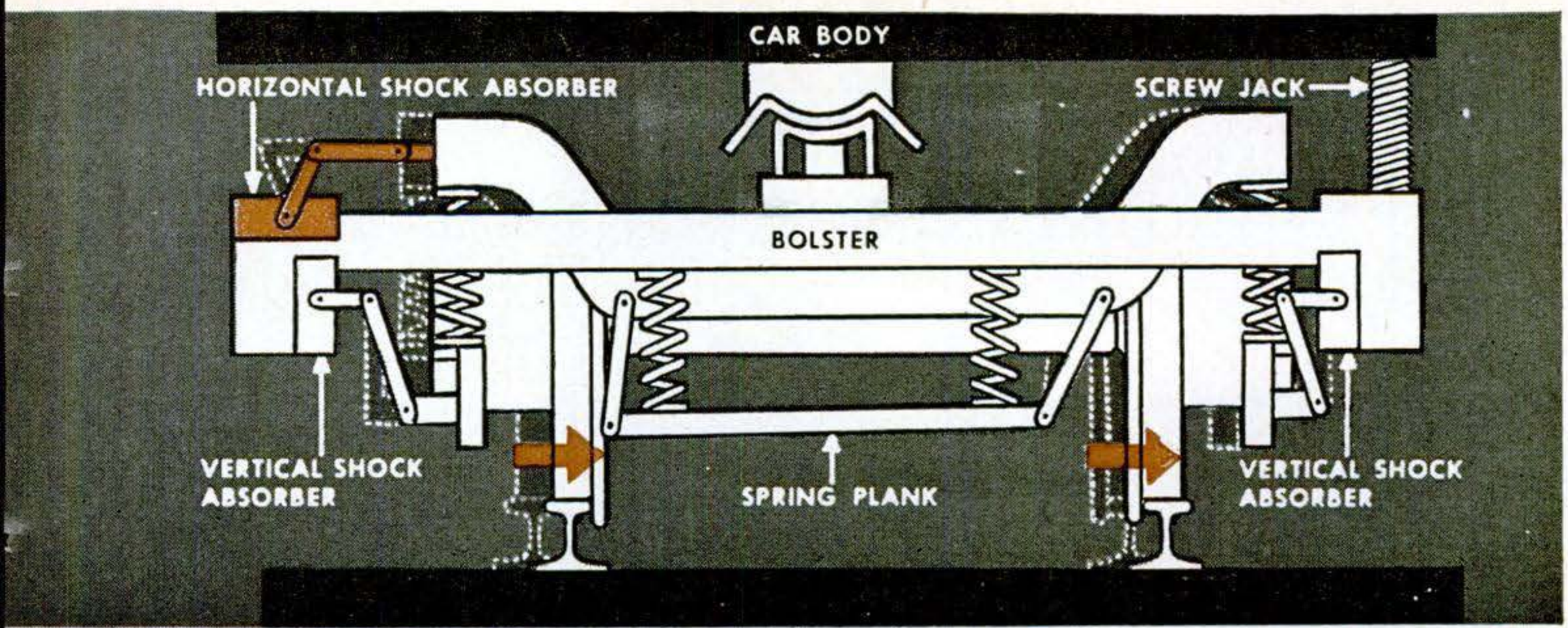
right direction to counteract the motion and hold the car body steady in its line of travel.

The tilting mechanism that banks the car body just the right amount for the speed on any curve is a separate unit. It consists of a gyro-controlled pendulum and two motor-driven, quick-acting screw jacks mounted at diagonal corners of the car between the body and the trucks.

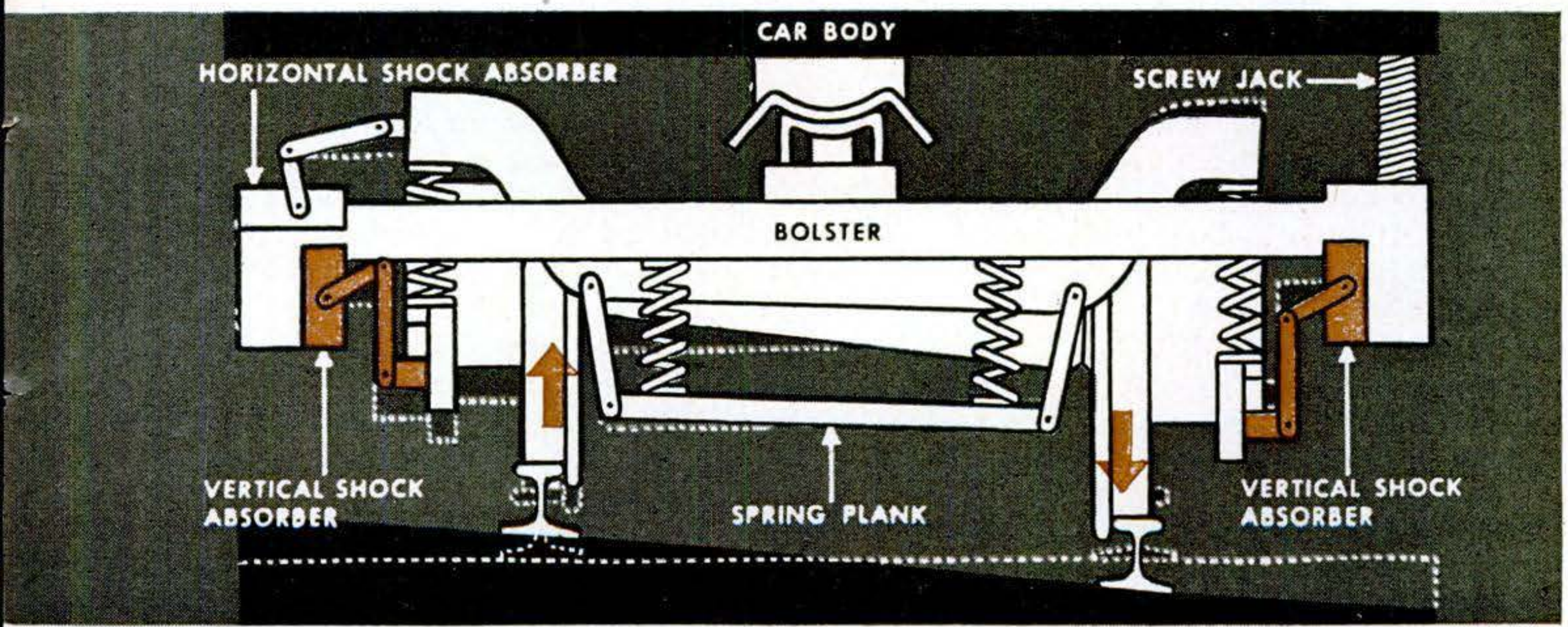
When the car enters a curve at any but the right speed for the bank of the track, either centrifugal force swings the pendulum out toward the outside of the curve if the speed is too high, or gravity pulls it toward the inside of the curve if the speed is too low. In either case, the pendulum makes an electrical contact, operating the screw jacks that tilt the entire car body the right amount in the right direction to provide the proper bank. Should the gyro-pendulum fail, a simple weight pendulum takes over.

With its present design, the automatic car-banking equipment corrects for tilt within a small fraction of a second after the car enters a curve. In two seconds it can add up to six degrees of additional bank in either direction to compensate for as much as 25 percent overspeed on any curve. Hence, even if the engineer throttled up to 75

Copyrighted material



To counteract lateral sway, this unit is mounted horizontally on one side of the car truck. It automatically pushes wheels either to right or left, offsetting any snaking in the roadbed and eliminating the motion that makes you weave when walking through an ordinary train.



Taking care of the ups and downs of railroad travel are these two vertically mounted, hydraulically operated antibounce units. These "educated" shock absorbers are being tested by one of the largest railroads, and their application to passenger buses is being studied.

m.p.h. on a curve designed for 60 m.p.h., you wouldn't be rolled around in your berth.

The bank compensator also corrects for tilt when the car stops at a station on a curve. When the train comes to a halt, the car is comfortably horizontal even though the trucks are pitched up at an angle.

The combined effects of the educated shock absorbers and the bank compensator on a railroad car, according to Westinghouse engineers, provide a ride four times as comfortable as present-day cars.

The same equipment, modified slightly, can be applied to passenger buses. END

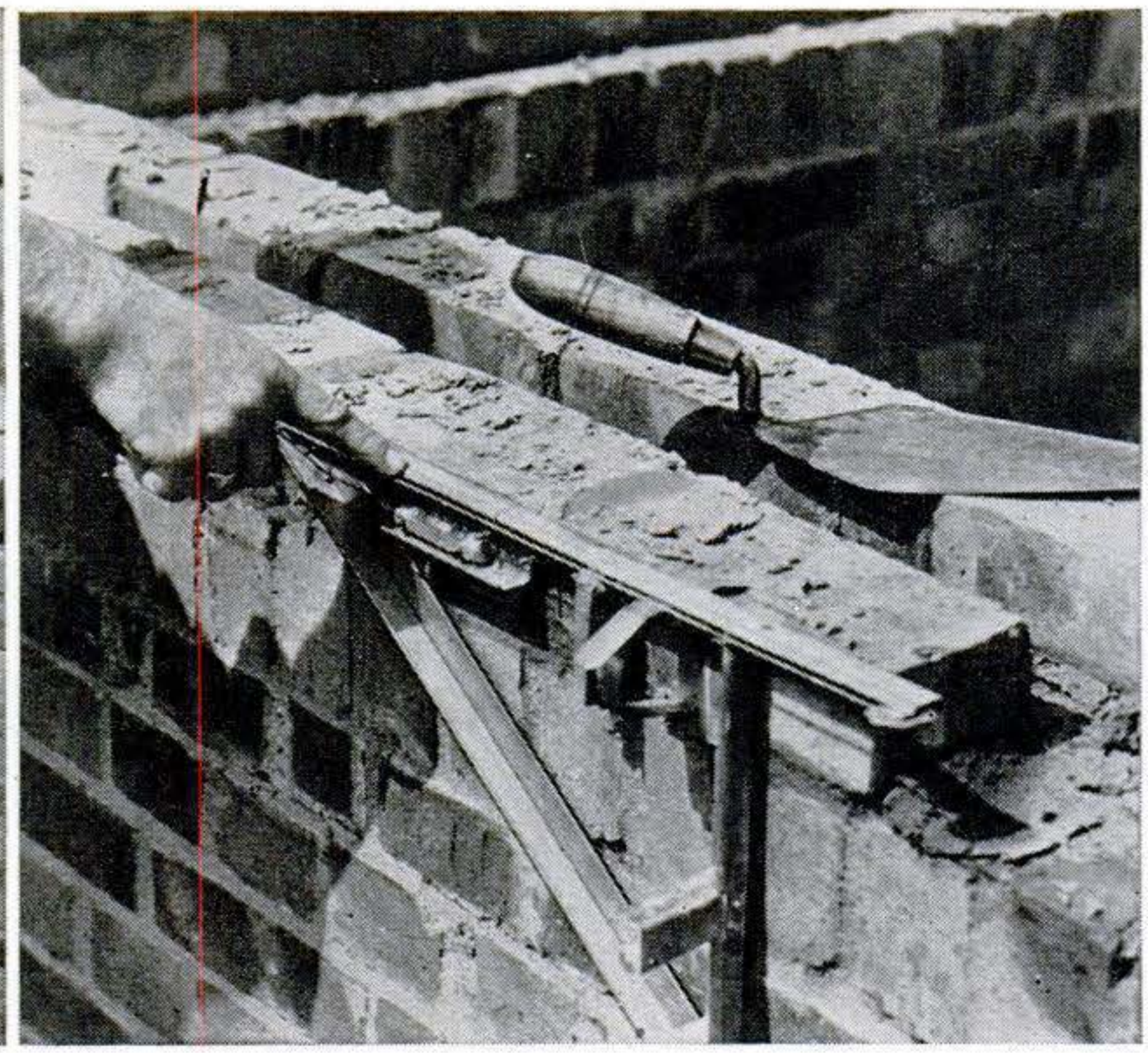
U-235's Power Shames Coal

Two pounds of uranium 235 would supply a day's power—about 1,000,000 kilowatts—for a city of 1,000,000 people. It takes 3,000 tons of coal per day to generate the same amount of energy.

Electron: Lightest Lightweight

THE electron—smallest particle known to science—weighs one/thirty-billion-billion-billionth of an ounce. Every second a 100-watt lamp is burning, six million trillion electrons race through the filament.

Copyrighted material



Bricklaying Speeded Up

A BRITISH inventor has come up with an aid to high-speed bricklaying that should help solve his country's housing shortage. It is a metal guide that replaces the present length of line used to make sure that all angles of the wall are correct. At left, above, the inventor, Mr. L. S. Beamish, is demonstrating how his new device can be used as a plumb line. The apparatus clips on the top course of the brickwork, and by means of spirit levels and plumb lines keeps both horizontal and vertical positions exact.

Finger in the close-up above is pointing to one of the spirit levels, which checks horizontal accuracy of line. In carefully timed tests, Mr. Beamish, using his device, laid 100 bricks in half an hour, or at the rate of 1,600 during an eight-hour day. Normal amount laid today by ordinary methods is between 400 and 500.

Tiniest Tube Paves Way For Wrist-Watch Radio

AT RIGHT is shown the comparative sizes of a wrist watch and the new miniature radio transceiver being developed by the U. S. Bureau of Standards. The set both sends and receives short waves and also picks up standard radio broadcasts. It was designed around the tiny radio tube, not much larger than a grain of rice, that is shown actual size in inset at lower left.

This world's smallest microtube was made possible by the elimination of bulky wires, which have been replaced by a silver chloride circuit stenciled on a slice of plastic or ceramic material. Developed as a result of co-operative research with industry, the miniature tube has various military applications aside from its use in the wrist-watch radio. Completion of the latter is being held up until a battery small enough to power the midget is developed.

Copyrighted material

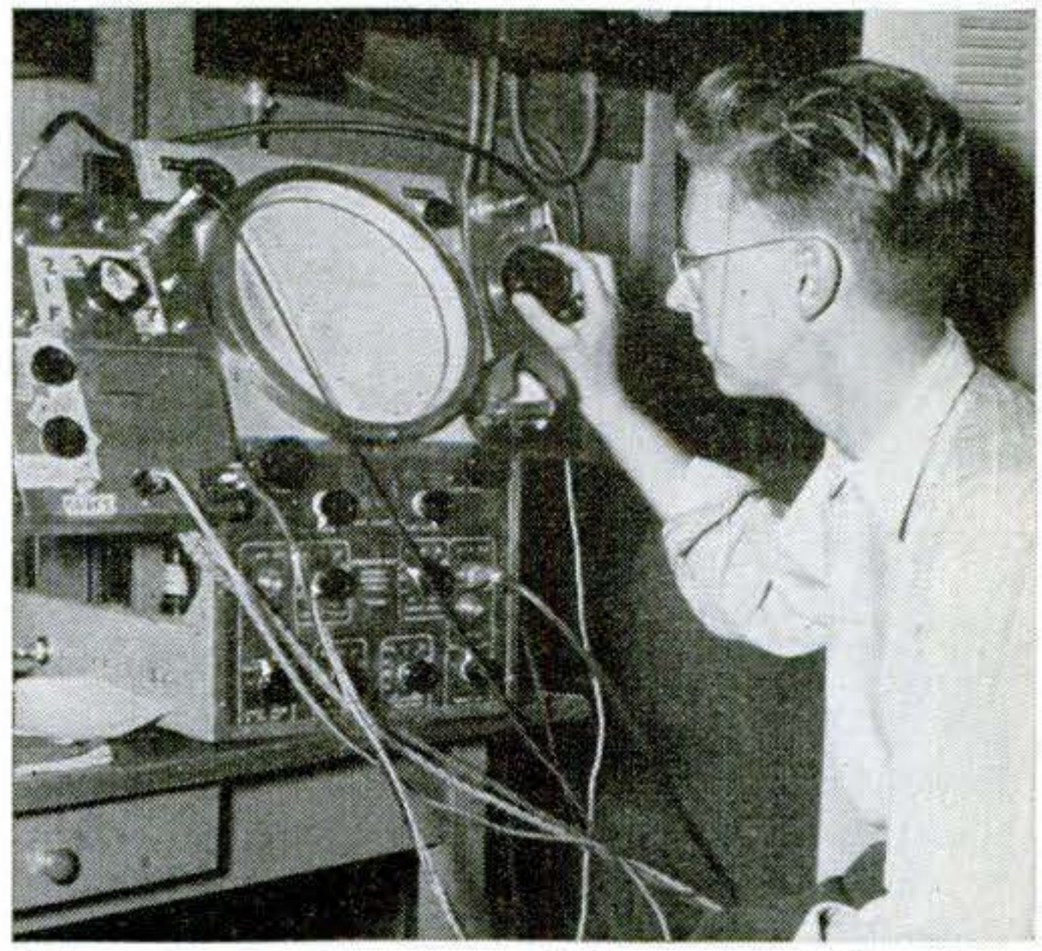
Radar Calls the Weather

"IT IS now 12 o'clock noon. At two, a heavy thunder shower will soak the racetrack, but should end before the first race at 2:30. The storm will not hit the ball park or bathing beaches."

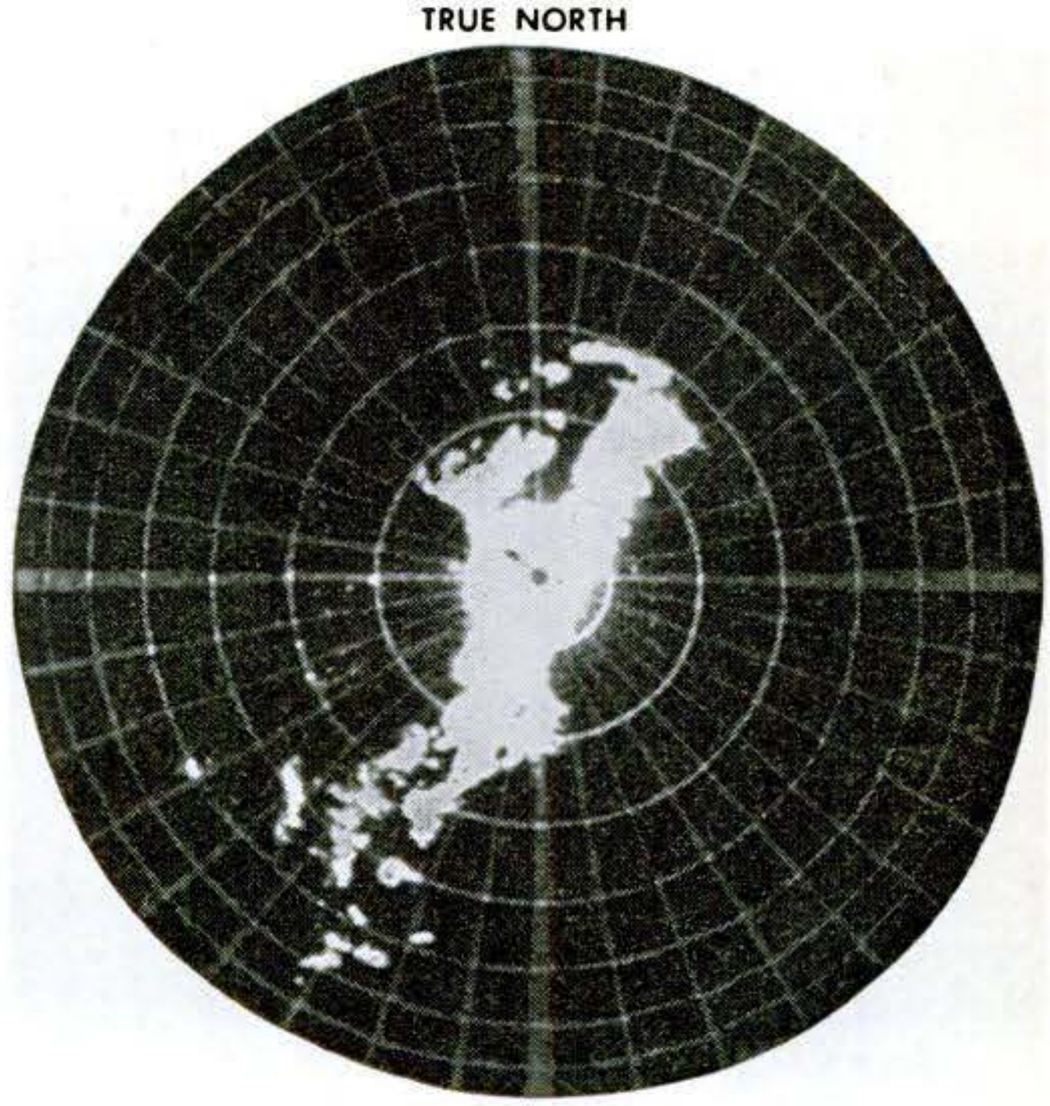
That is the kind of pin-point weather prediction Canadians may soon receive from a new system being developed by the Dominion's Defense Research Board. It uses wartime radar equipment to locate approaching rainstorms and measure their speed and direction. From this data, meteorologists can easily calculate exactly where and when rain will fall. The method permits 80 percent accuracy in forecasts two hours in advance.

Many applications are expected for this new short-range weather service. Canadian Army spokesmen suggest that housewives could be warned to close the windows and take in the wash before going shopping; approaching air liners could be advised of rain expected at airfields; the power company could even be told when dark clouds would cause a sudden demand for electric lights.

Rain (but not fine drizzle) reflects radar waves just the way an airplane does, creating an image of the storm on the viewing screen. Every army and navy radar operator knew that, but not until 1944 did Dr. J. S. Marshall, of McGill University, Montreal, begin to develop radar as a meteorological tool. Tests in 1945 at Clinton, Ontario, and Dorval (near Montreal), Quebec, showed the system worked very well. Two experimental installations are now in operation in Ottawa.



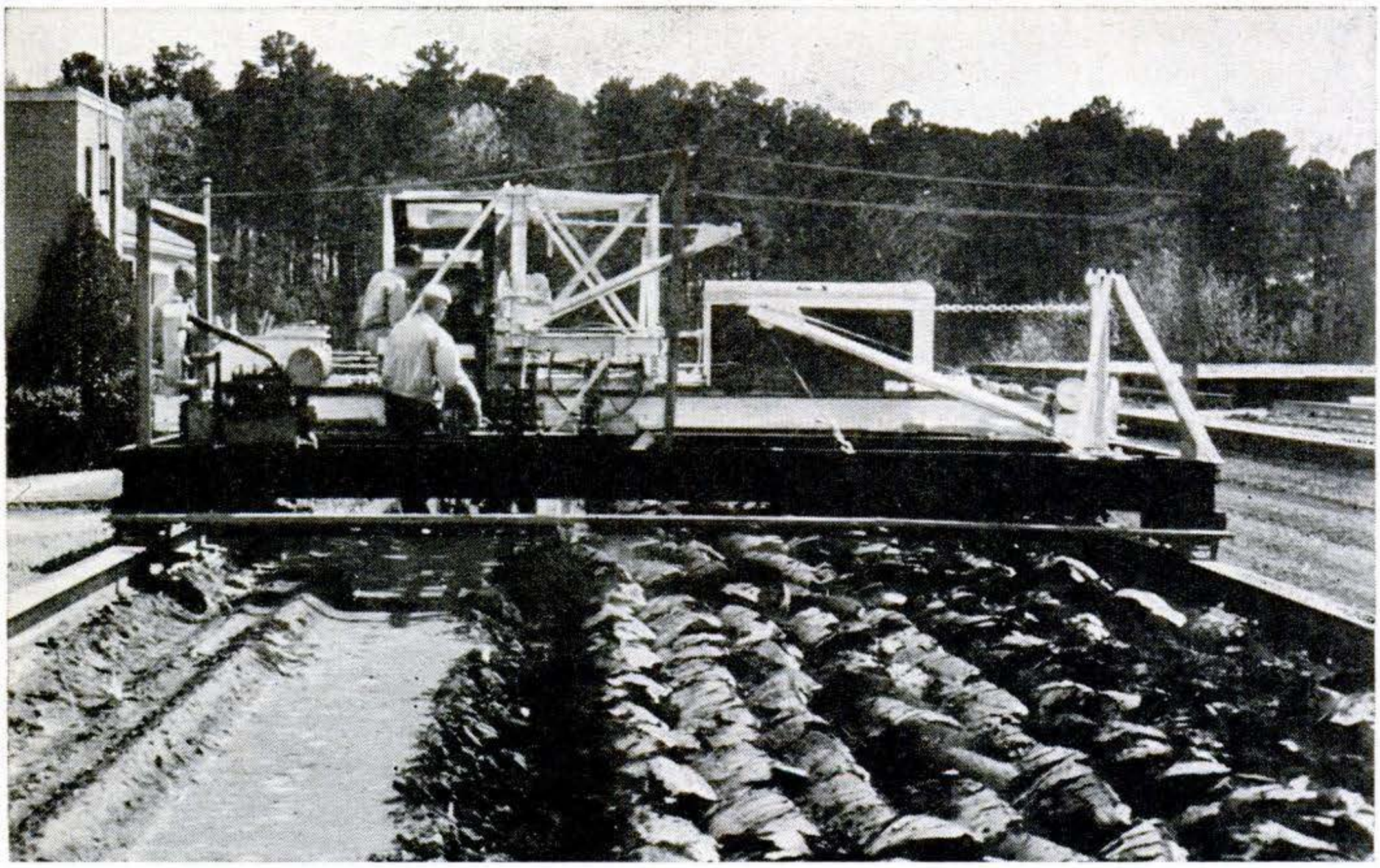
Adjusting radar-scope dials, a McGill technician measures height of approaching clouds; a second scope measures distance. Range is limited to about 160 miles.



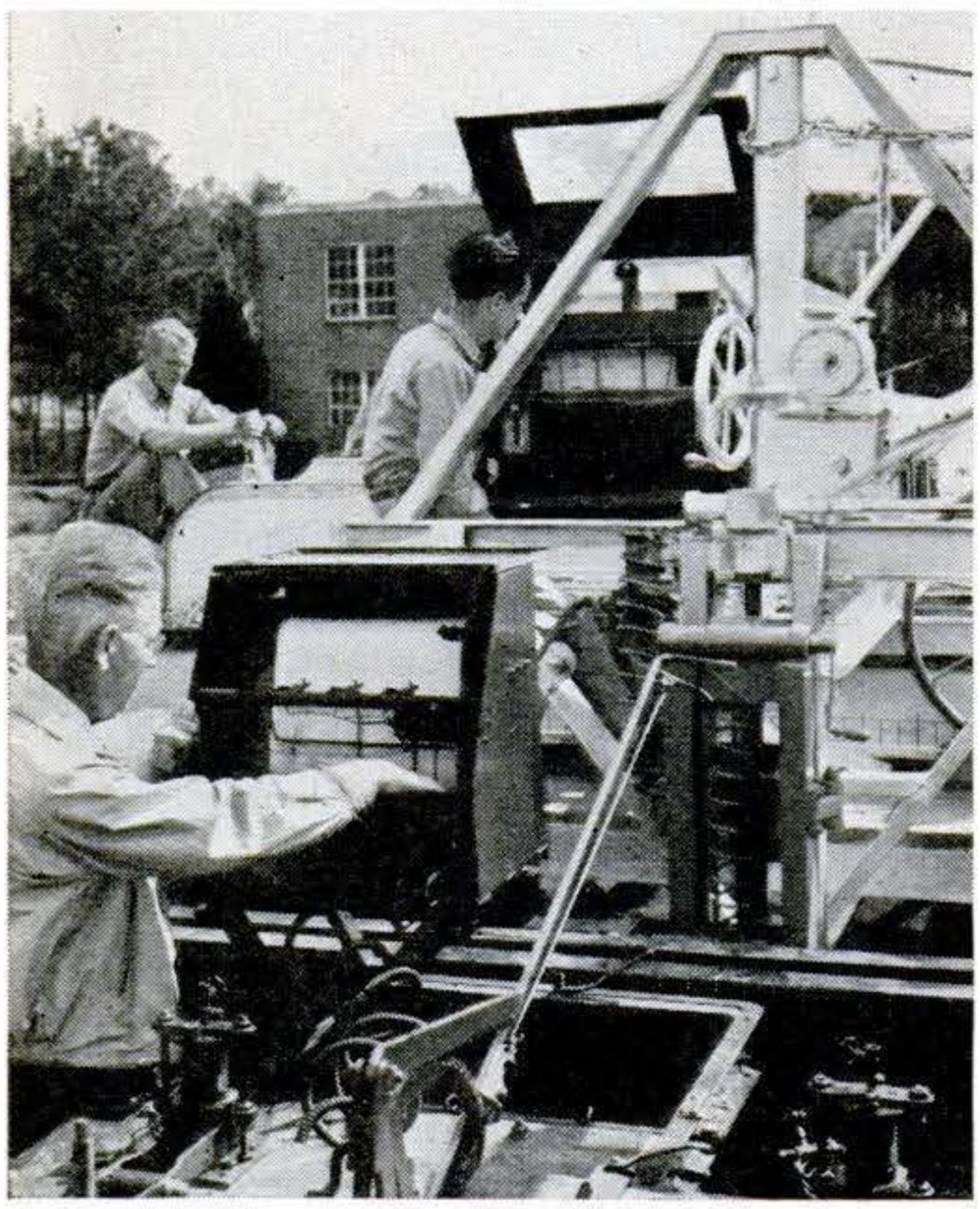
Storm approaching over the Laurentian Hills from the northwest at 2:15 p.m. is picked up by radar scope and thrown on screen as shown above. At right, storm is shown hitting Montreal at 4:15 p.m., exactly as predicted by the radar forecaster. Read by expert technicians, these radar photographs clearly show the size, course, depth, speed, and rain density (size of drops) of an imminent storm. Experimental sets now in operation may prove the system's ability to detect forest fires or give warning of approaching dust storms.

Copyrighted material

"Plow Proving Grounds"



The 135-hp., motor-driven testing rig, riding on rails that flank the long, narrow test plots, pulls plowbottoms, sweeps, disks and other tillage tools through the various soil types. It operates at speeds from .2 to 10 m.p.h., pulls drawbar loads up to 5,000 pounds. Here a plowbottom is being drawn through "heavy" soil, one of the 10 representative types.



A dynamometer measures the forward, side and vertical forces exerted by the soil against the implements under test and records them permanently on a time-calibrated chart (above).

This automatic peanut sheller, one of the laboratory's many developments, shells and cleans 300 pounds of peanuts for planting an hour—as much as 30 men could do in 10 hours.

Copyrighted material

Improve Farmers' Tools

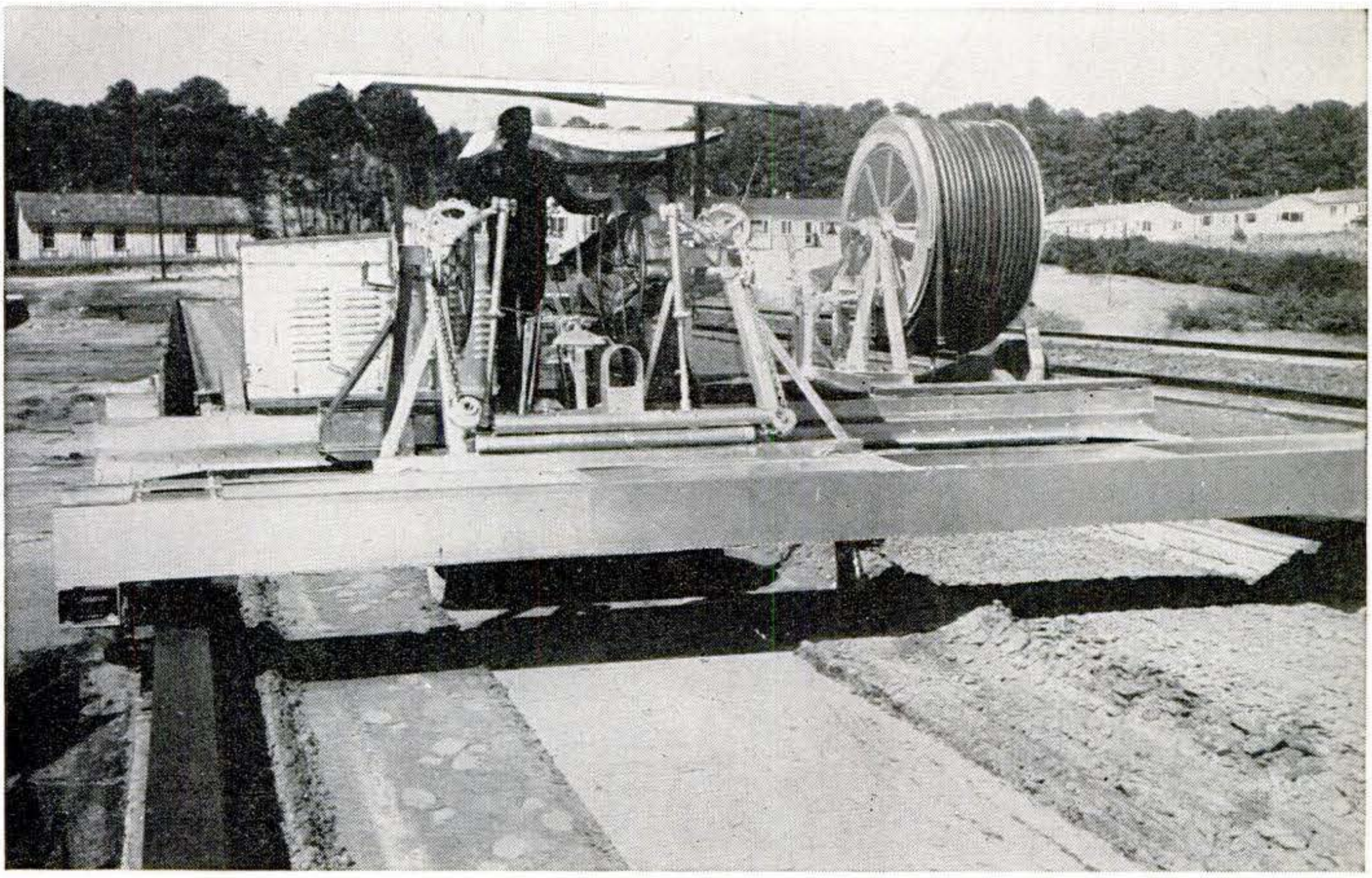
WITH special machines and a variety of soil samples, federal farm experts can reproduce almost any farm in the Southeast right in their own acre-sized back yard at Auburn, Ala. Here the U. S. D. A.'s Tillage Machinery Laboratory, one of the first of its kind, is learning just what happens when a farm implement slices through the soil. From such accurate and detailed studies are coming not only improvements in existing machinery but vitally needed new tools.

The test grounds are 10 ribbonlike, rail-lined strips, 250 feet long by 20 wide. These narrow "bins" are filled with soils typical of the Southeast, varying from heavy clay to light sandy. Riding the rails above them are two odd but ingenious motor-driven machines looking much like over-sized hand-cars on giant railroad tracks. The first flattens, packs, scrapes or sprinkles the soil as desired, while the second pulls all kinds and sizes of tillage tools through the dirt after it has first been prepared.

More than 3,500 plow and disk tests have already been made at the Laboratory, and the results point the way to better tools and techniques. One discovery, for instance, was that a furrow slice, once thought to break up into layers that slid over each other as it moved up the moldboard, did so only when the surface earth was hard-packed or matted with roots. Such data help to match plow design to soil condition.

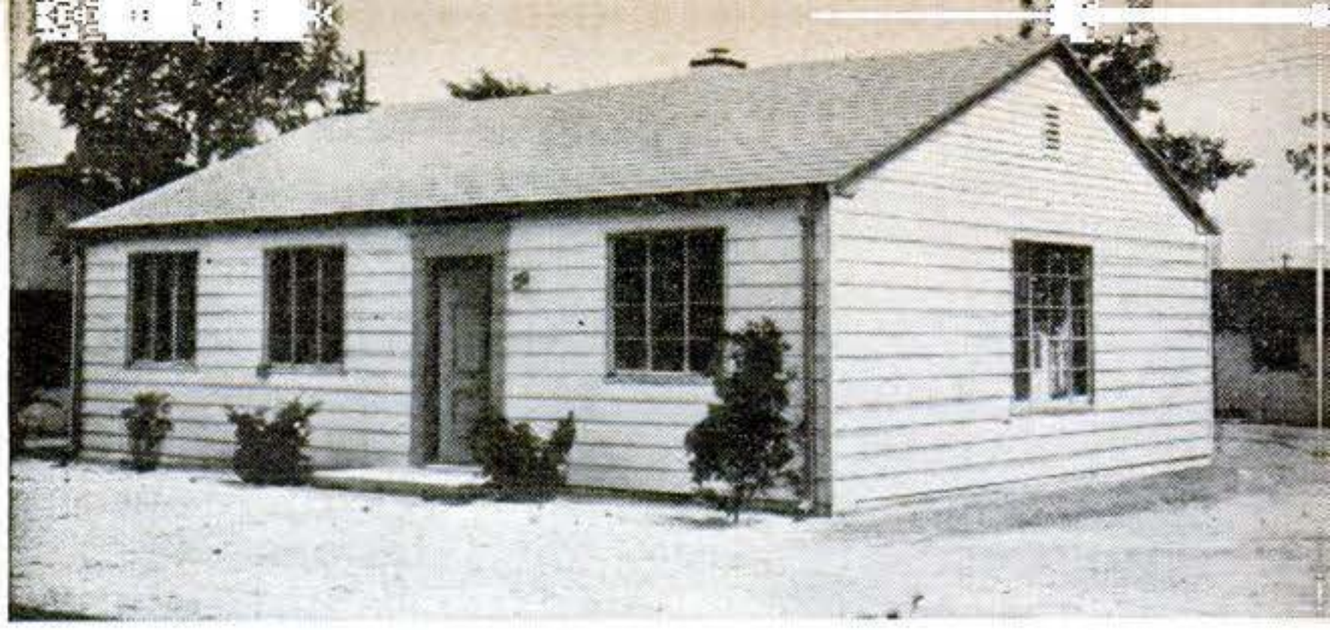
While its chief interest is in soil-working machines, the Laboratory has given much time to designing and testing special equipment. One such development is a tractor-drawn peanut digger-shaker with which one man can harvest 15 to 30 acres a day. Another is a lightweight, portable tung-nut sheller that can be taken into the field.

The Laboratory is especially concerned with the Southeast, since two of the three major crops that have so far defied mechanization, peanuts and cotton, are concentrated there. To break this bottleneck, it has gone to work on such tall orders as a machine that will fallow soil without stirring it deep enough to cause loss of moisture, a cotton planter that will place the seed just below the soil's surface without a furrow, and a harvesting machine that will thresh peanuts while still green to eliminate stacking and improve the soil's fertility.



The soil-preparing machine rides the rails like its tool-testing brother, can be rigged with subsoiler, leveling blade, disk, subsurface packer, flat roller or sprinkler. It can thus put the soil in any condition desired for a test. Here loose soil is being packed by a flat roller, will later be planed level. Note the large reel of hose for feeding water to the sprinkling attachment.

Copyrighted material



Building A House an Hour

By Hartley E. Howe
PSM photos by W. W. Morris

WHEN the 7:30 whistle blows each morning at a cluster of grey shops just outside Baltimore the yard is packed with the makings of houses—steel joists, lumber, siding, shingles.

By 11 o'clock the top layers of these piles have been built into four walls and a roof. At noon, walls and roof have been moved onto a foundation and assembled into a complete three-bedroom house shell—wired, insulated, and ready for partitions and finish. When the 3:30 whistle stops work for 1,000 men, a dozen house shells may stand where there were only base slabs that morning. When finished, the houses look like the one at the top of this page.

A house an hour, eight to a dozen a day, five days a week—that's what's happening at Harundale, Md. Here the Byrne Organization, Inc., a large contracting firm, is giving a challenging demonstration of what builders call "site fabrication."

Site fabrication is simply an attempt to gain some of the advantages of prefabrication—assembly-line production, the use of power tools, job simplification—without the drawbacks. The big hitch in prefabrication is shipping the heavy, bulky house sections to the site and lifting them into place. The site fabricator's answer is to ship his entire factory to the site. This isn't as paradoxical as it sounds: he plans to build not just one house, but hundreds or thousands of them, all in one area.

Obviously, this is much less flexible than prefabrication. Not only must many houses be built, but they must be in the same neighborhood and practically identical. Harundale is a good example. It is to have

Quonset hut shops in the background house the $700,000 house factory that is the heart of site fabrication at Harundale, Md. In the foreground can be seen houses in various stages of completion. At the left are concrete base slabs, then four walls without roofs, then house shells awaiting final touches. Note irregular placing on site to avoid monotony.

Copyrighted material

1,200 units on a 299-acre site. Except for minor changes, each house is just like those on either side of it.

The houses at Harundale are set irregularly along winding streets among pine groves, but the heart of the project is a group of eight huge Quonset huts shrouded by dust from ever-moving trucks. Four of them house a warehouse, mechanics' and electricians' shops, a carpenter's shop and a paint shop. In each of the other four, a main component of a house is built.

A minimum of lumber—only 1,500 board feet plus 300 square feet of plywood—is used in the Byrne house, as compared to 4,400 pounds of steel. The only parts cut in the carpenter's shop are closet parts, shutters and trimming. These are then taken to the paint shop and spray-gunned, in a fraction of the time hand brushing would require.

House Parts March in Line

The roof and wall shops are the real core of the factory. Both the roofs and walls are formed out of V-sections of steel, laid out on jigs, cut and welded together. These frames pass down production lines to trucks that haul them to the building sites. Complete fabrication of a roof and walls takes less than four hours.

The plumbing and heating shops finish their work far ahead of the others. Ordinarily one of the most expensive parts of a house, the plumbing for these houses is quickly put together in the shop, first into subassemblies, then into one main assembly for each house. This plumbing system and the heating pipes are fixed in place by the concrete slab, which is poured as much as two weeks ahead of the fabrication of walls and roofs. Only three plumbing connections are made after the plumbing system leaves the assembly line. These are for the kitchen sink, the vent stack and the soil pipe.

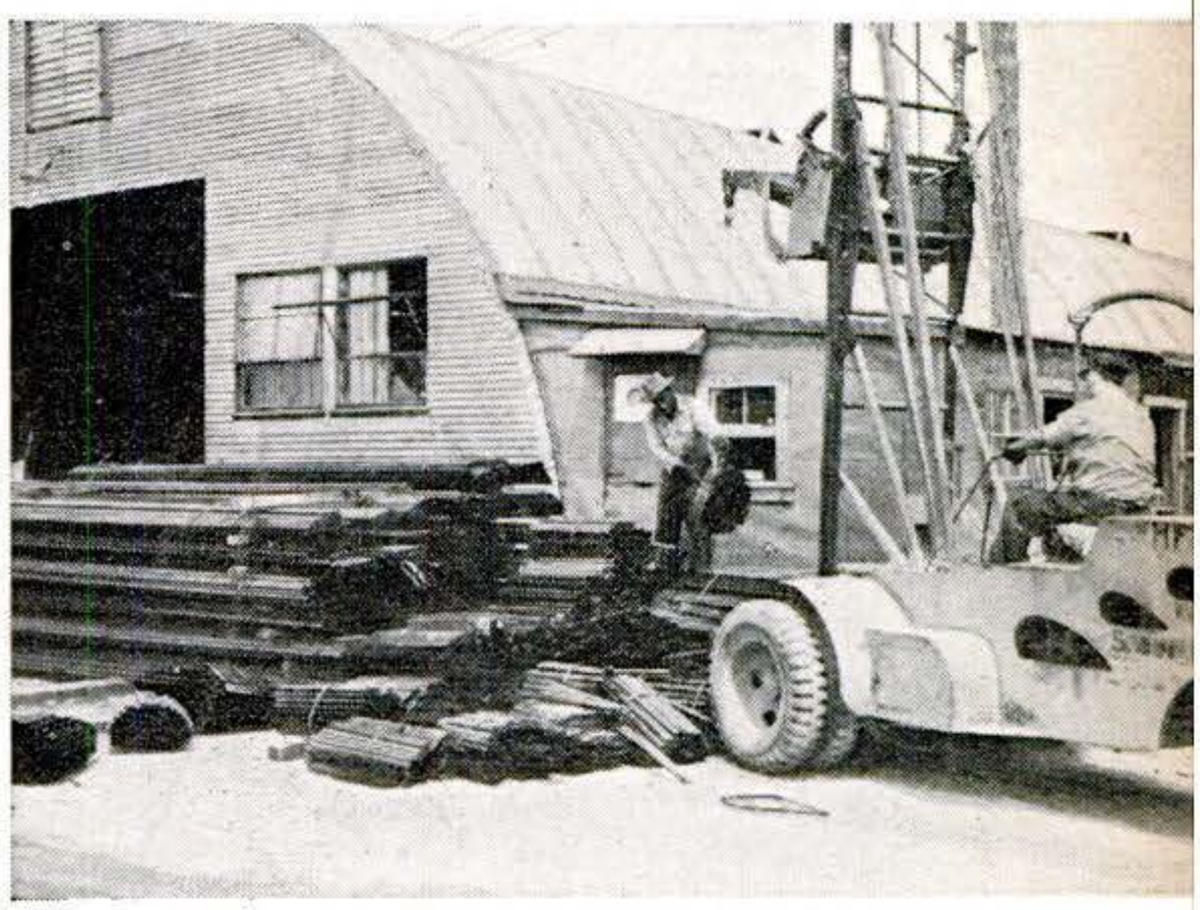
The Byrne house has radiant heat provided by hot water piped through the concrete floor slab. The copper coils are welded into six subassemblies in the shop in 45 minutes, then welded together on the site. As the concrete is poured around them they are tested under 250 pounds of pressure—air bubbling through the concrete will reveal leaks that escape the most careful inspection. Using an oil burner, these radiant panels are expected to enable the occupant of a Byrne house to heat his home for about $64 in a normal year.

Assembly of the four walls and roof is quickly done, then lathers and plasterers zip up the partitions and finish off the inside walls. Hot- and cold-water pipes, precut in the shop, are installed; the furnace, hot-water heater and kitchen sink connected. Closets go in, final trim is added, and on goes the sale price: for 998 square feet of house on a 60- by 100-foot lot, $7,450. The stove, washing machine, refrigerator and garage are all extra.

In detail, Byrne site fabrication is flexible. Neither methods nor materials are permanently fixed; siding and roofing are changed on the basis of costs and experience; processes are shifted back and forth between shop and field. But the main principles of site fabrication are held to. Even though only one-fifth of the 1,072 man hours required per house are spent in the shop, they result in a complete house shell, wired and insulated.

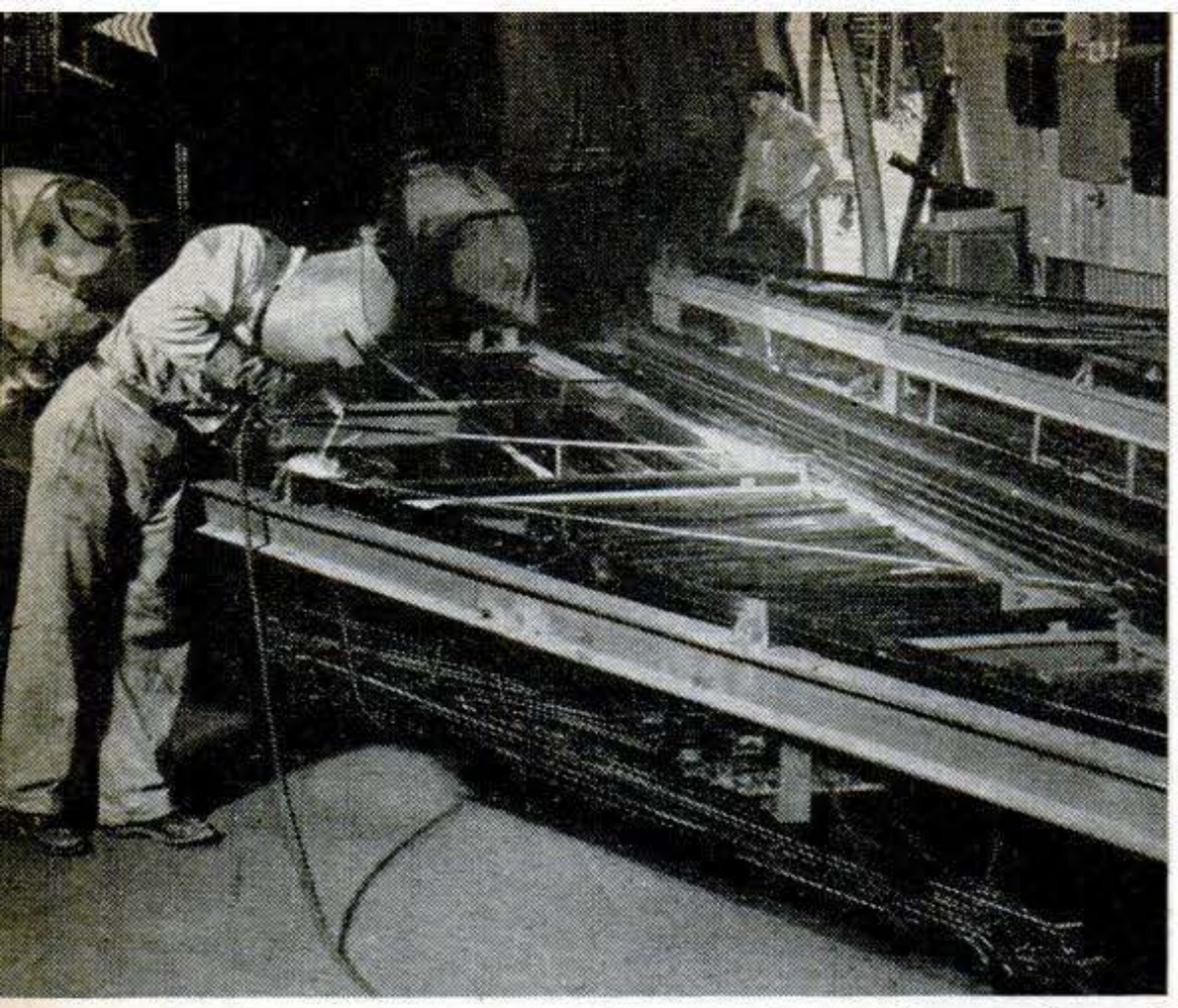
To justify the $700,000 plant investment Byrne engineers figure they must build a minimum of 500 almost identical houses in one place, even though much of the equipment and shops can be reused. Byrne is already considering moving much of his Harundale factory to Peoria, Ill., where a large company wants a huge housing project site-fabricated for its workers.

Not that the Byrne outfit will wash its hands of Harundale when the last house is finished. Byrne Communities, Inc., will continue to direct a 16-acre shopping center in the heart of the development. Here will be located a supermarket, drug store, restaurants and specialty shops.

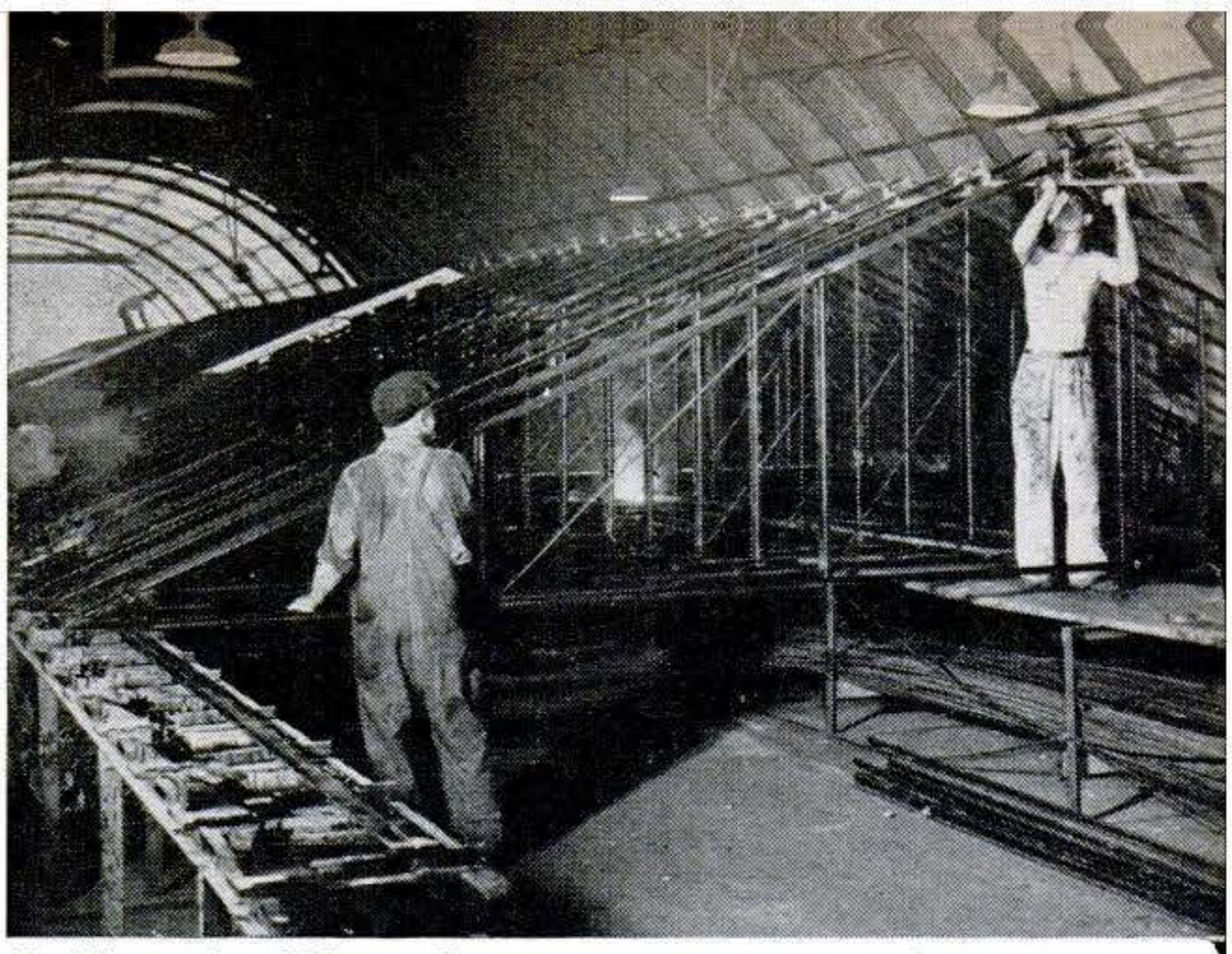


1. At 7:30 a. m., materials are piled high outside shop. Before noon, they will be in a roof. To see how site fabrication builds a house shell in less than four hours, turn page.

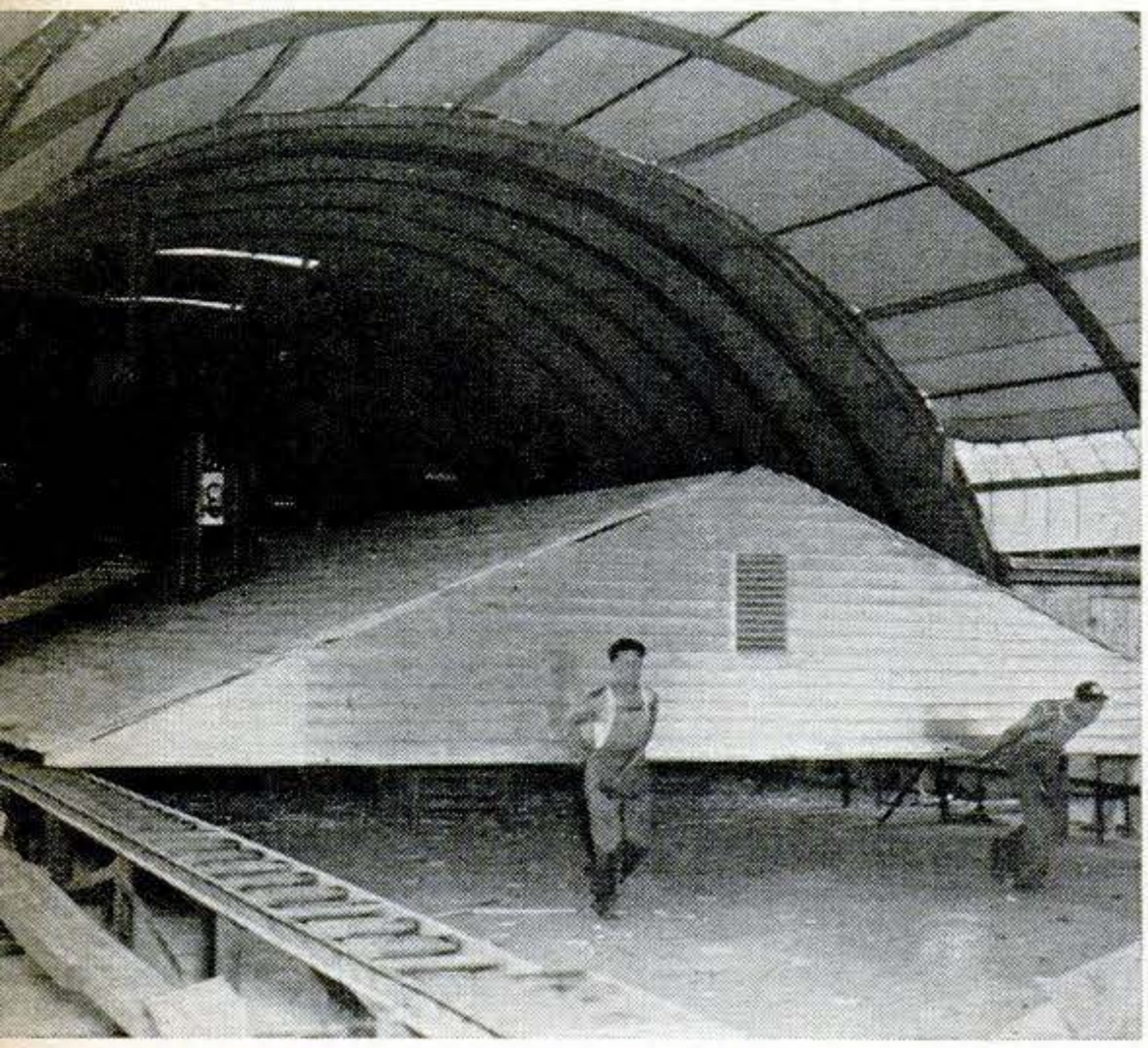
Copyrighted material



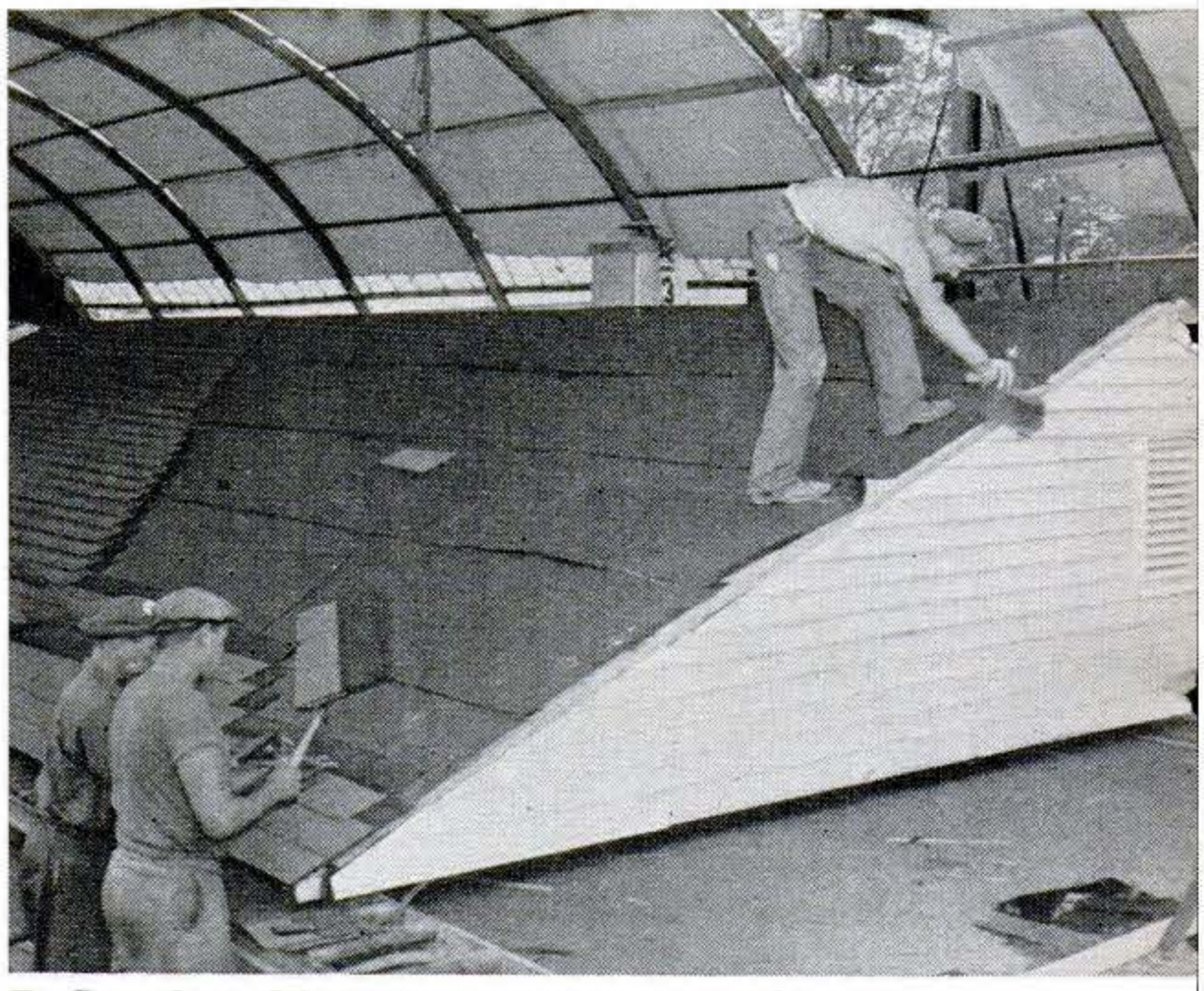
2. First step is to lay steel members of roof trusses out on jigs that ensure correct placement in a hurry. Then they are cut to length and welded. The trusses are finished by 8:30.



3. Now the 20 roof trusses are set upright, spaced every two feet by jigs, and joined by lengthwise steel beams into a complete roof skeleton. This is welded by 9:30.

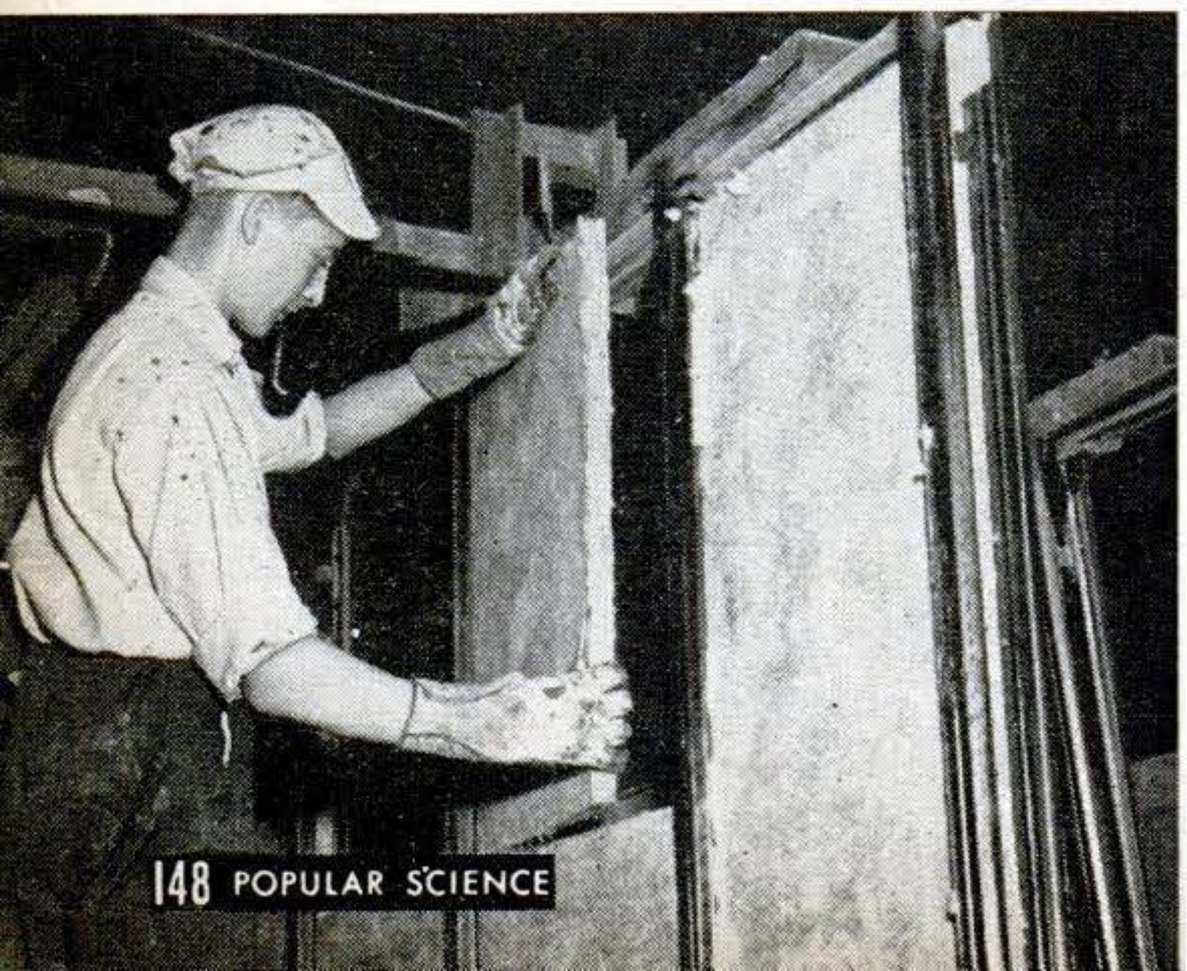


6. Rolling along the track seen in the foreground, the sheathed roof is now manhandled up to the next work point. The chimney framework will be lined and covered by cement board.



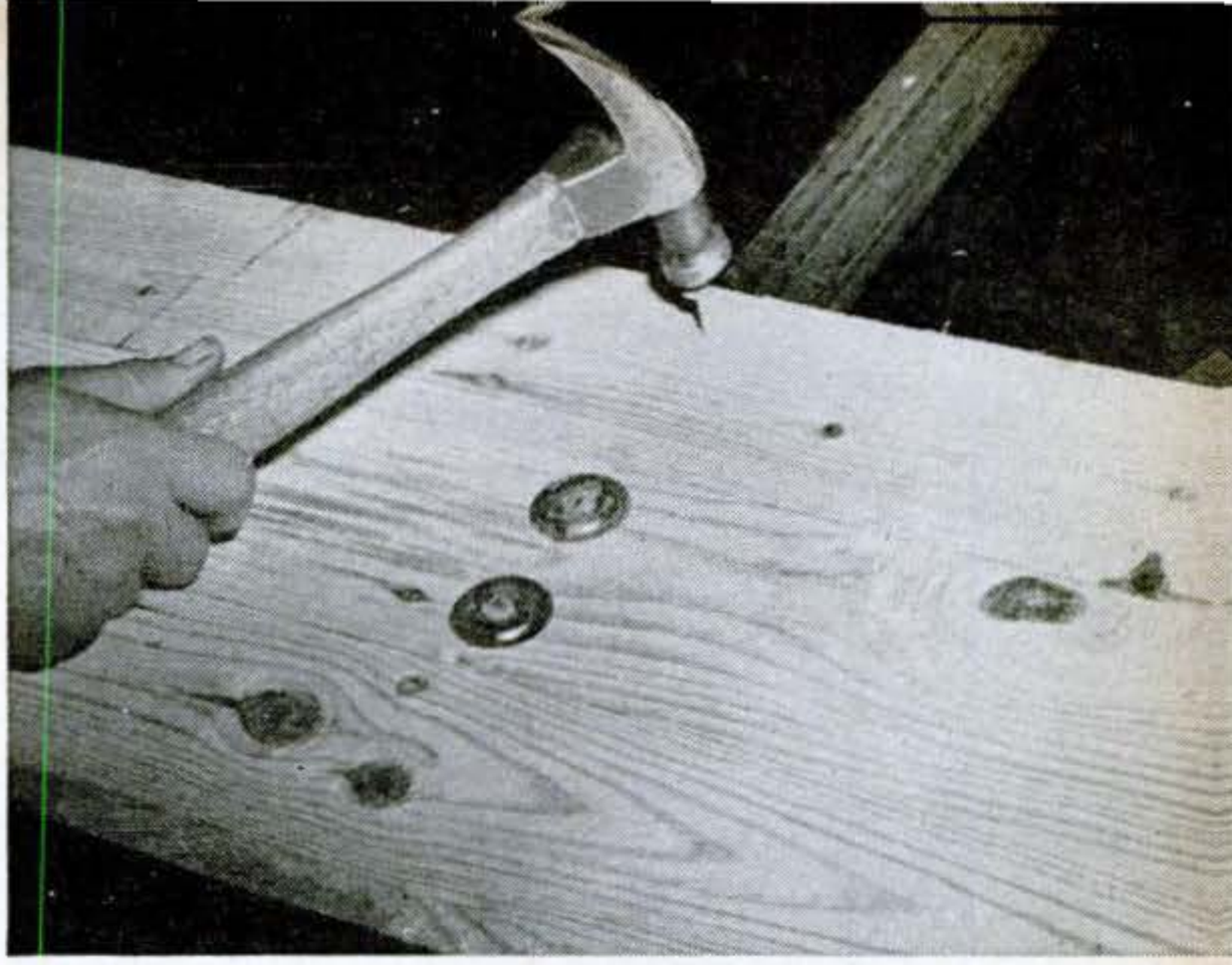
7. It takes 10 minutes more to nail on the roofing paper and another three-quarters of an hour for the asphalt strip shingles. Some houses have aluminum roof. Shingles are on by 11:05.

10. Fiberglas insulation is slipped between studs after subassemblies have been welded into wall frames. Window frames and wiring are already in, and wall is ready for siding by 9:35.



11. Aluminum siding strips, interlocked at edges, are now nailed over tar paper to complete the wall. Other siding materials, including stucco, were experimented with earlier.

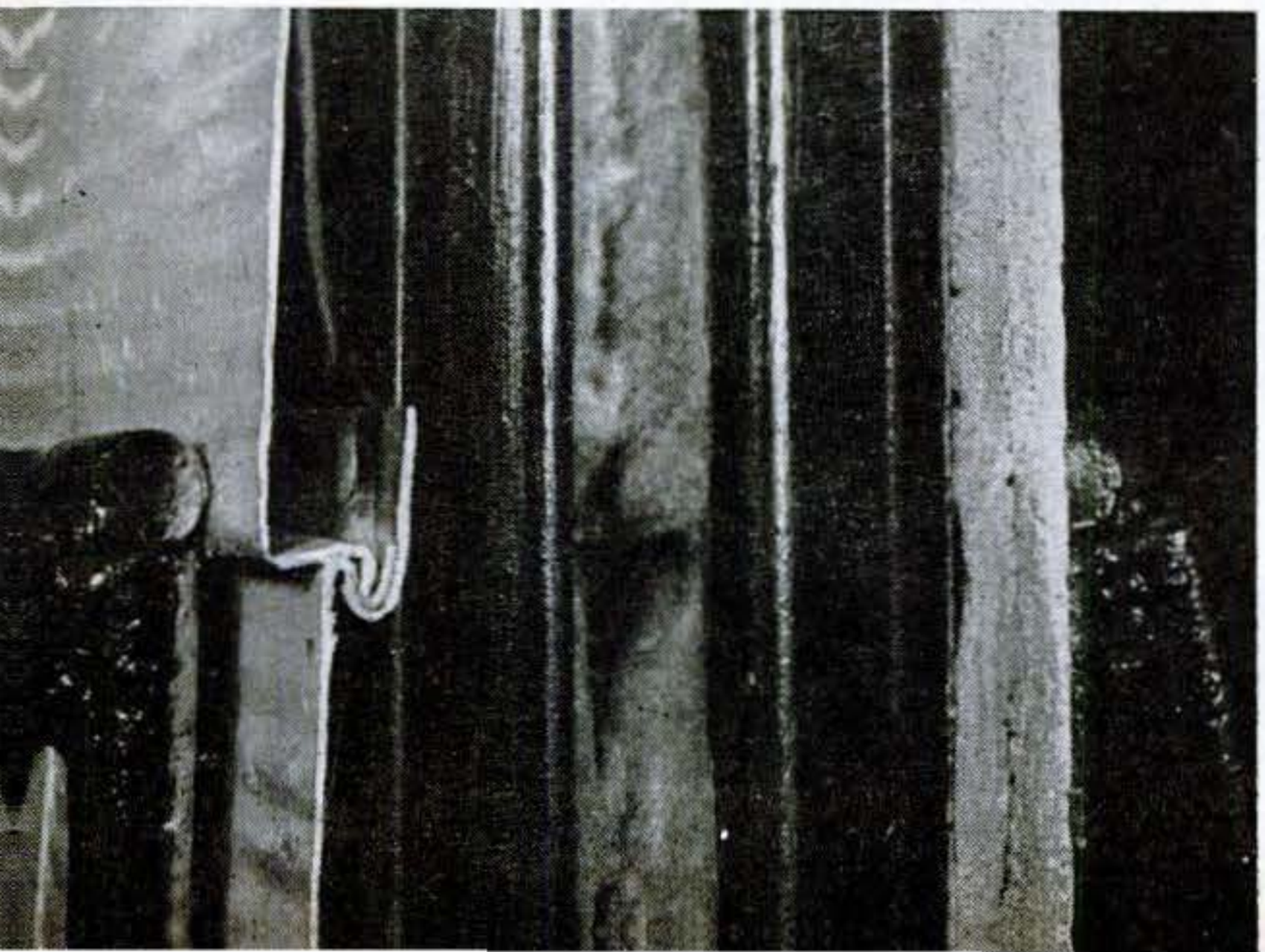
4. The two gable ends are covered with building paper, and aluminum siding sheets are nailed on. Sheets are crinkled to resemble clapboards. The ventilator louver is prefabricated.



5. Next the wood sheathing is nailed on. Close-up shows how groove in steel rafter permits board to be nailed to it. V-section inside rafter grips nail tightly. Sheathing is on by 10:15.

8. At the end of the line an overhead tackle lifts the 4½-ton roof and a big truck backs under it. It's taken three hours and 50 minutes to build it—and it will be at the site by 11:30.

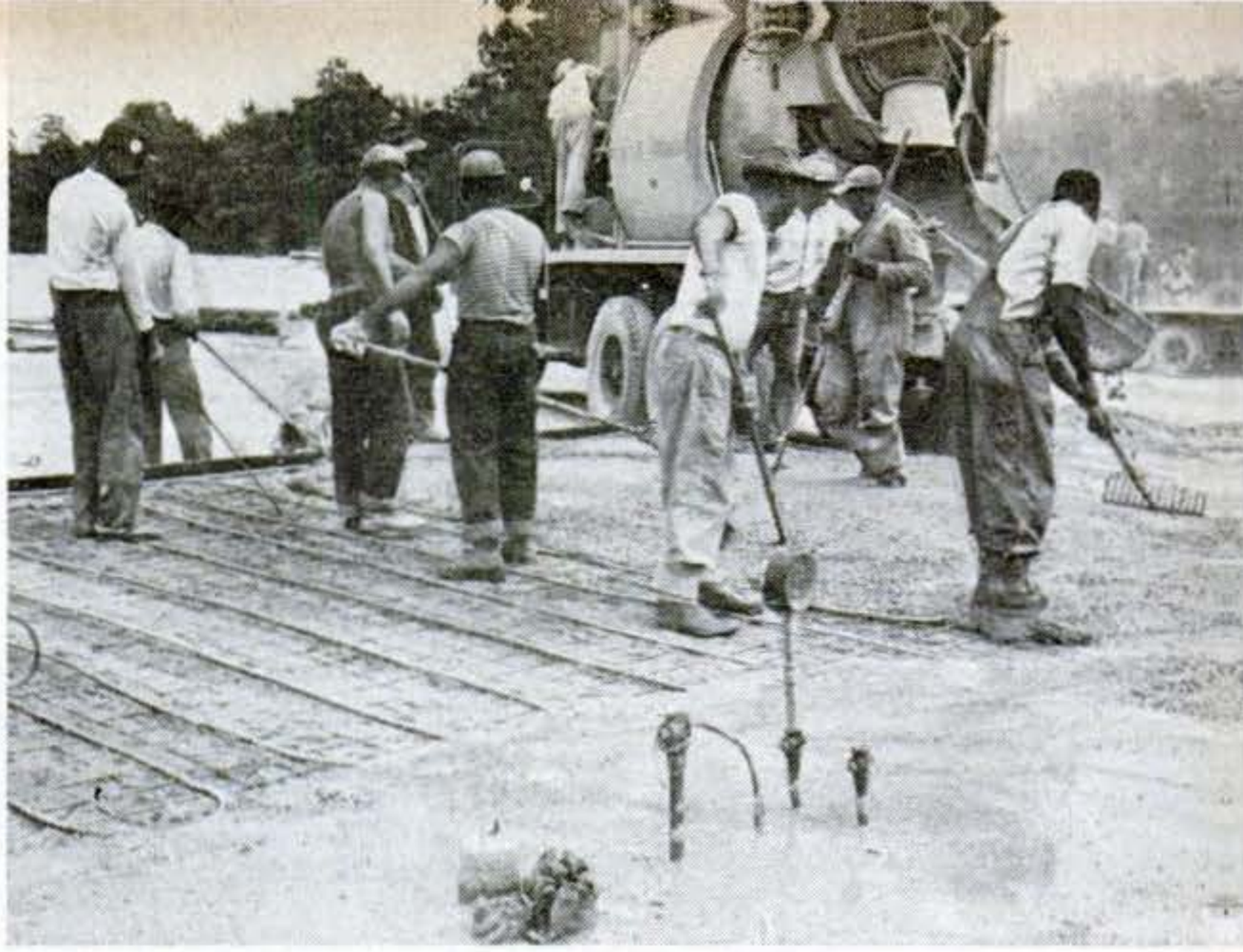
9. Meanwhile, the walls have been taking shape in the shop next door. Here, light steel V-sections are being welded into wall subassembly, finished 20 minutes after shop opens—by 7:50.



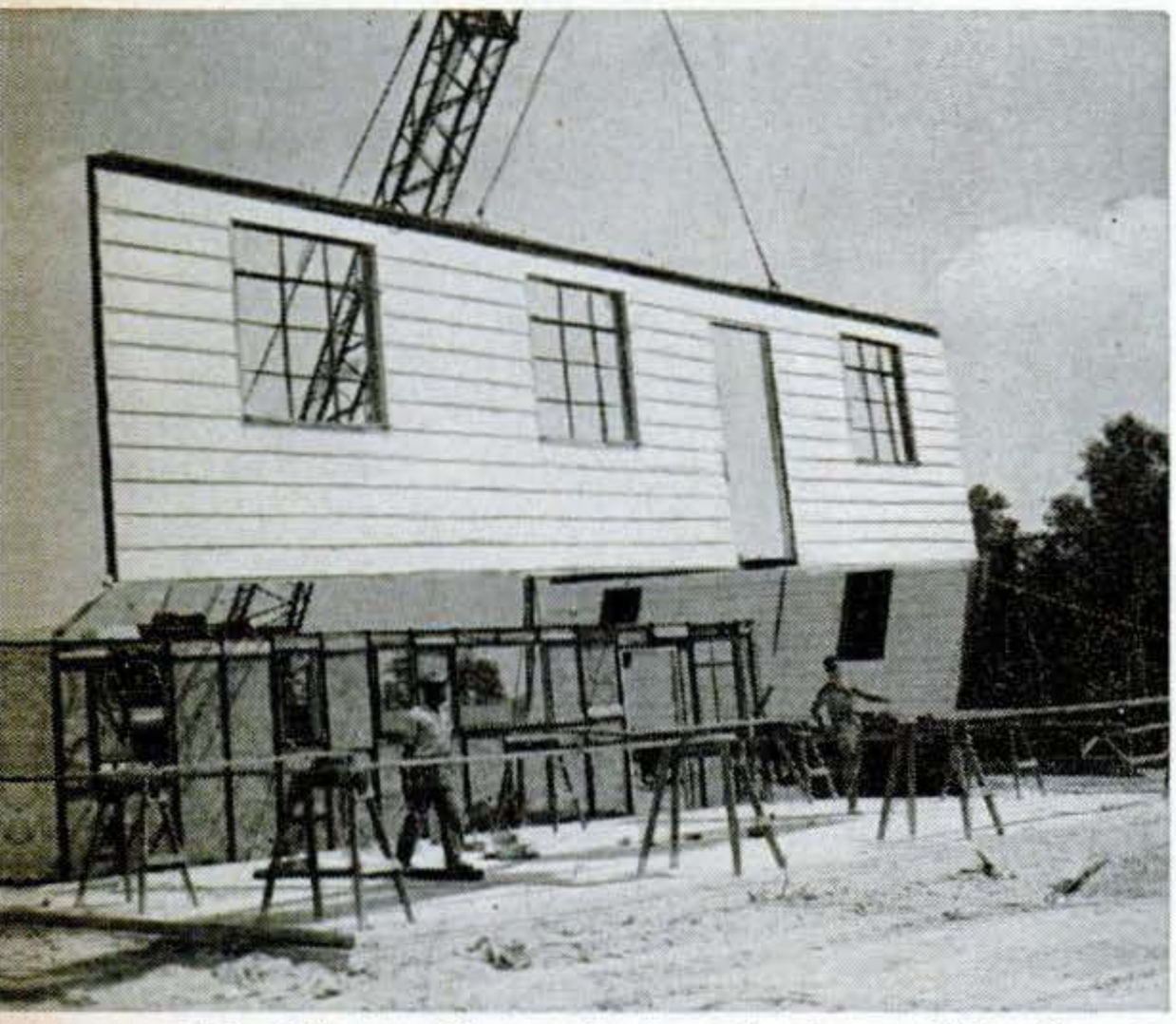
12. Cross section of a wall shows how the Reynolds aluminum siding interlocks in a tight, galeproof joint. From left to right are siding, steel stud, Fiberglas panel, stud and two coats of plaster.

13. Now the completed wall is lifted on the truck that will take all four to the site. From start to finish the walls took three hours and 45 minutes; they are completed at 11:15.

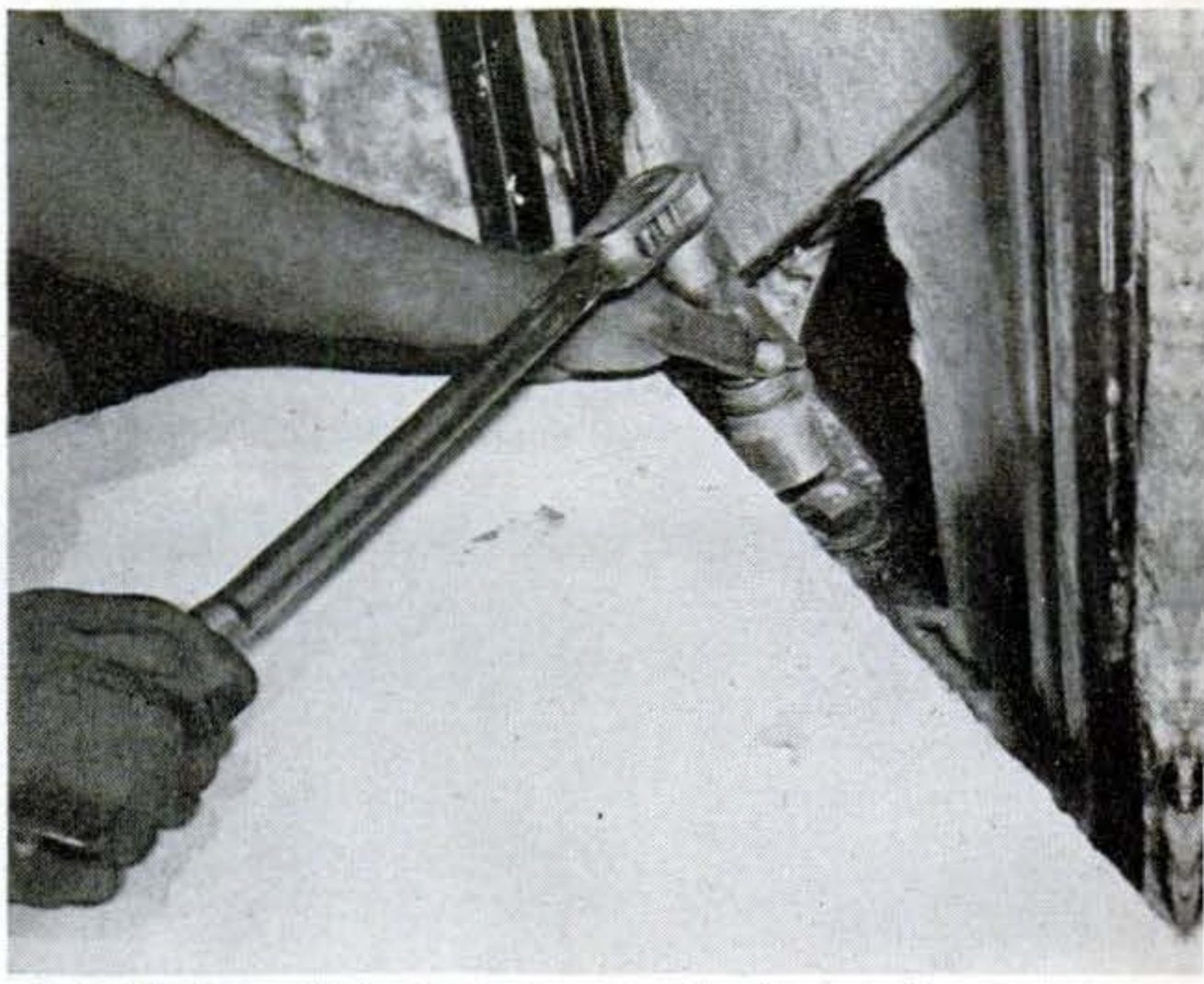
14. Plumbing and heating pipe assemblies have been put together days ahead. Here is a main plumbing assembly in its jig. Plumbing takes 1½ hours in the shop, two hours more at site.



15. On the site the radiant heating coils, previously assembled in the shop, are joined together and covered with three or four truck-loads of concrete to form base slab.

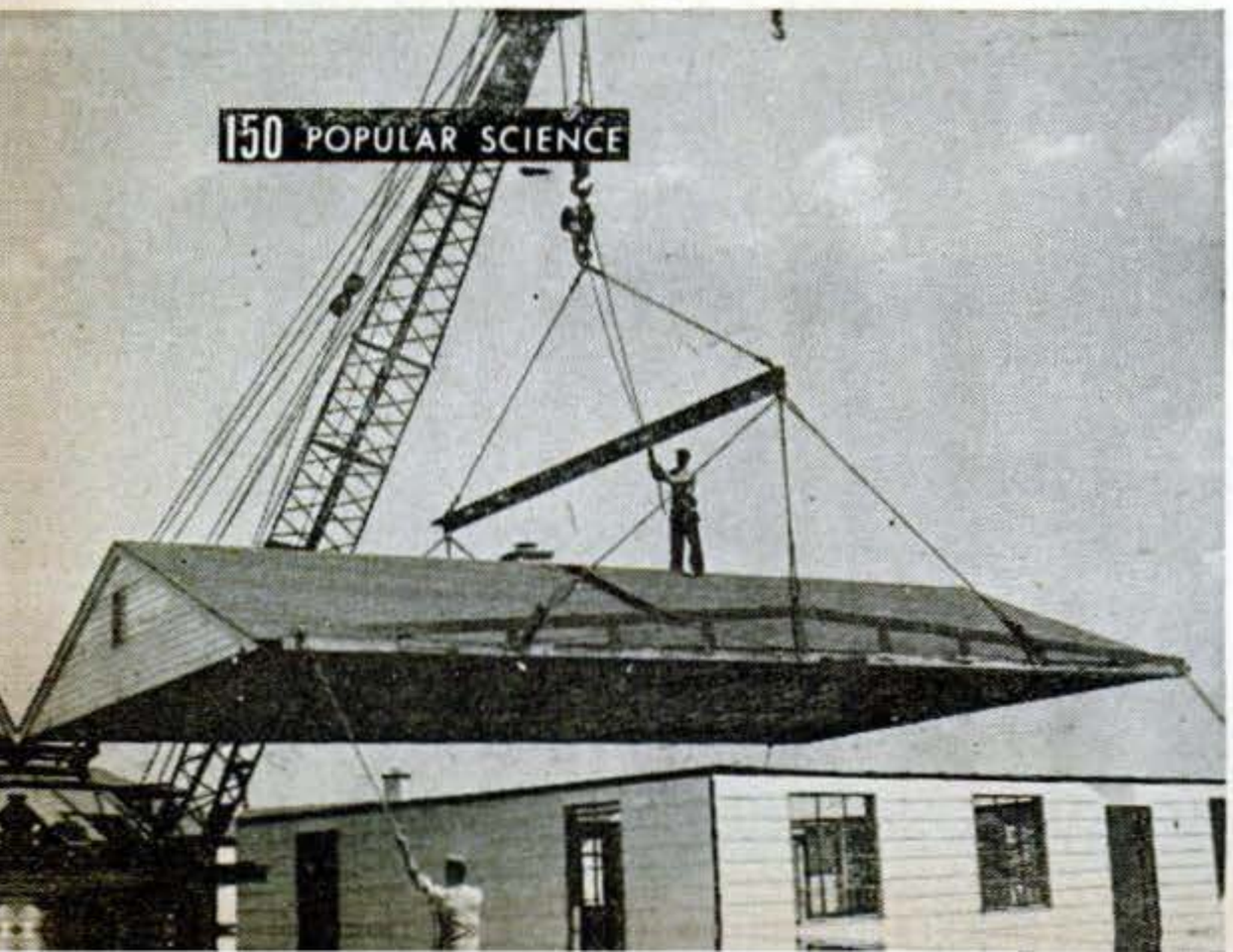


16. The walls arrive at the base slab after it has cured for several days, and are lifted into place by a huge crane. Here the second wall drops down as the others wait in the truck.

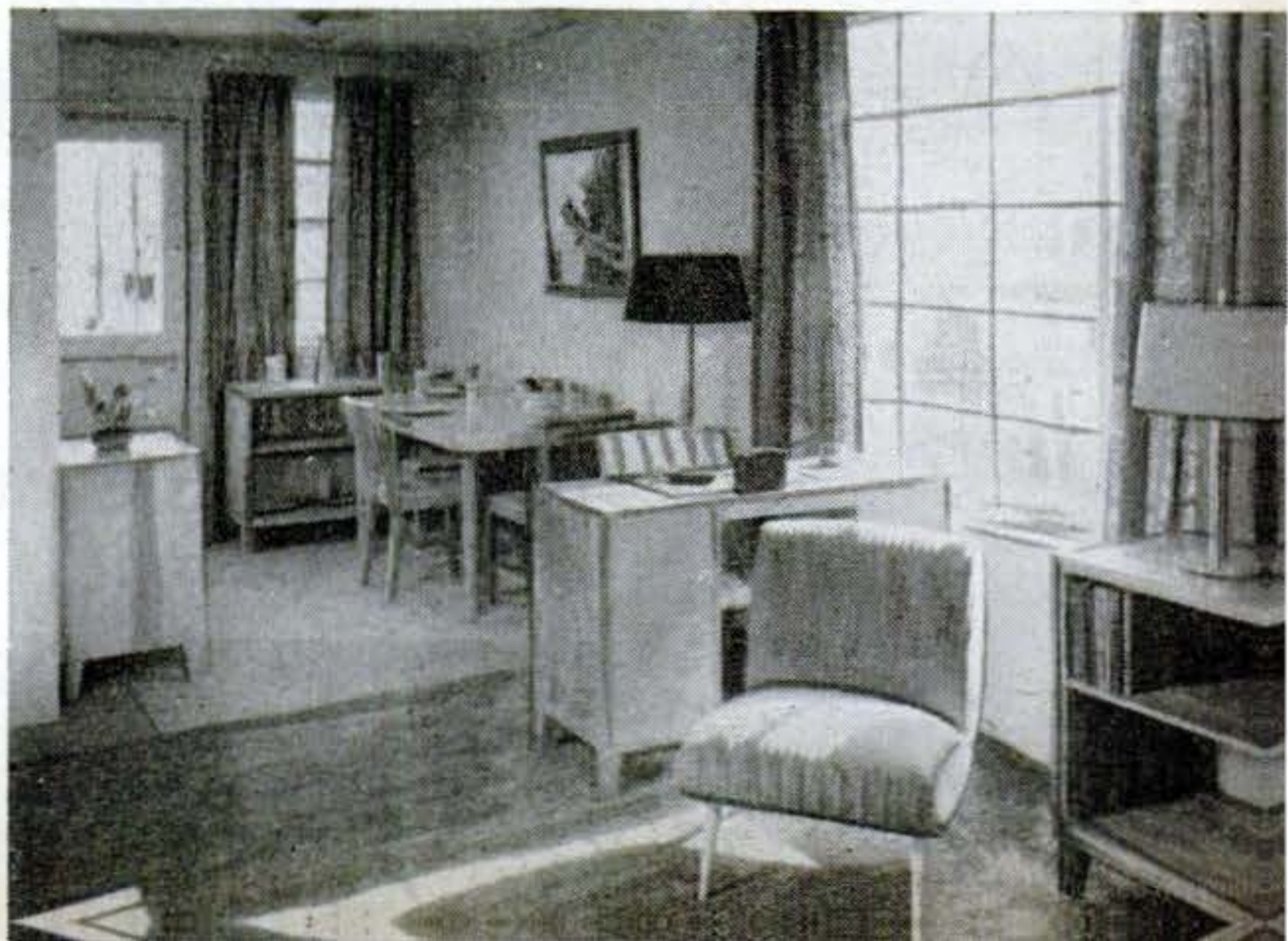


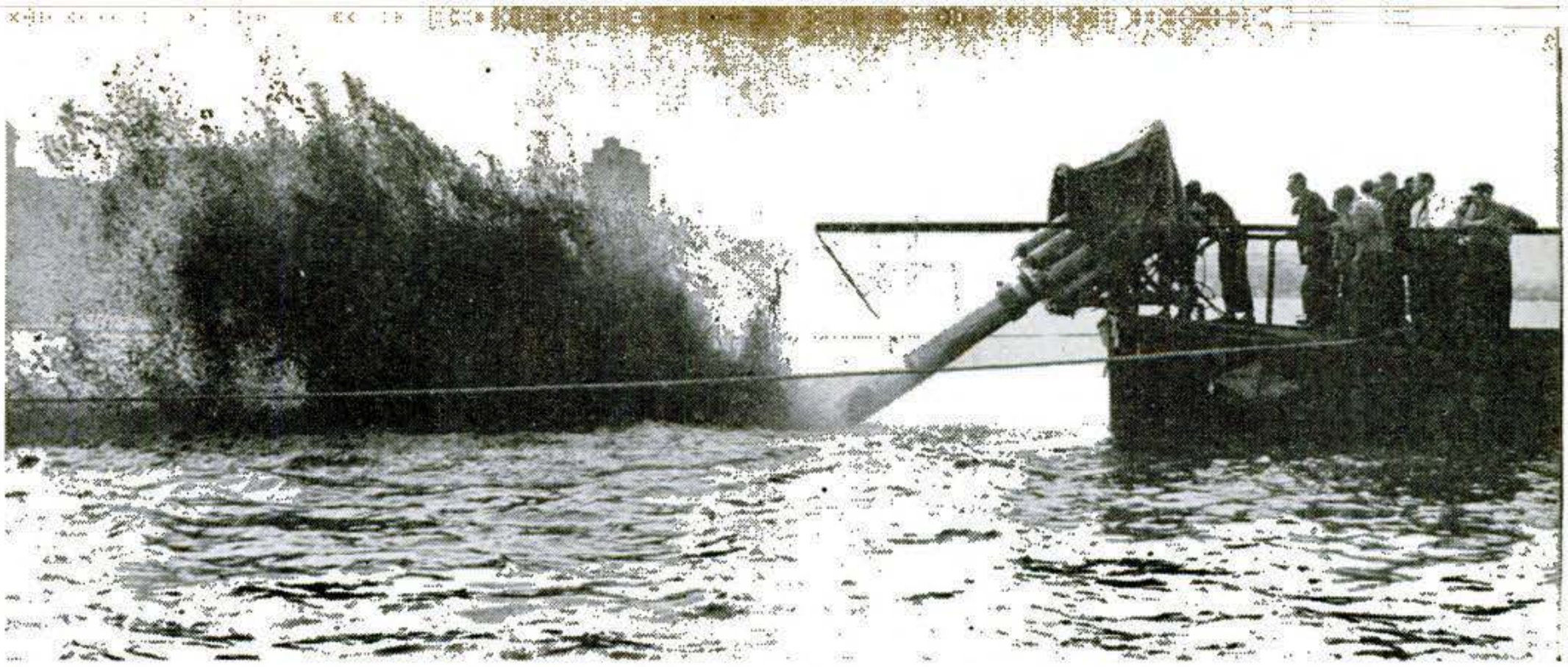
17. Each wall is bolted onto the foundation with 34 tie bolts. The cutout piece of insulation will be replaced. Corners of the walls are fastened by wire until they are welded together.

18. Now a crane drops the roof onto the four walls. At full speed, a crew puts walls and roof together in 24 minutes, so a house shell started that morning is finished by 11:55.



19. Interior of finished house. Walls have been welded to roof and ceiling insulated. Floors are asphalt tile. Houses are scheduled to be completed 21 days after base is poured.





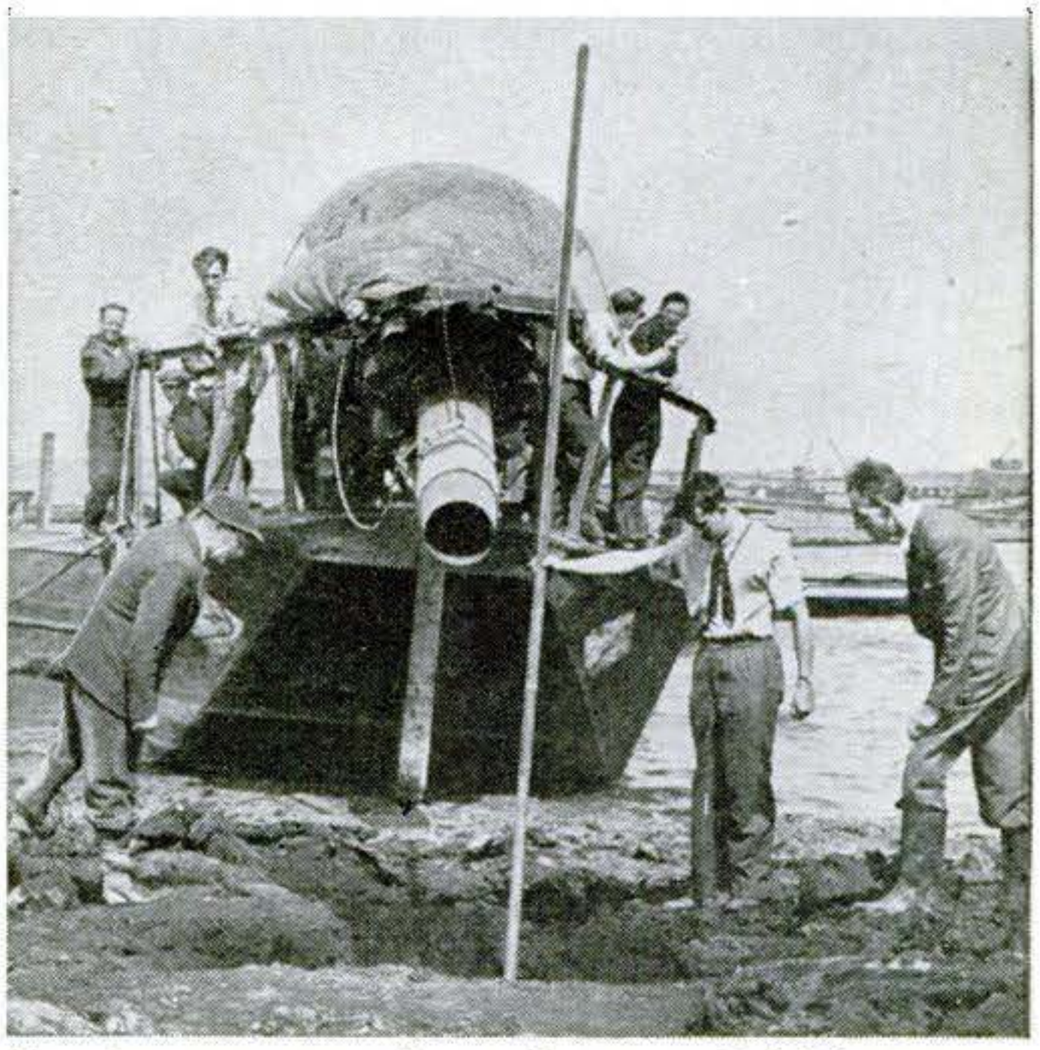
Mud and water are thrown 20 feet in the air as a barge-mounted jet looses its fiery breath at the bottom of the River Thames. Through three feet of water, it gouged huge holes in the muck, dispersing about a ton of it every minute.

Jets Are Jacks Of Many Trades

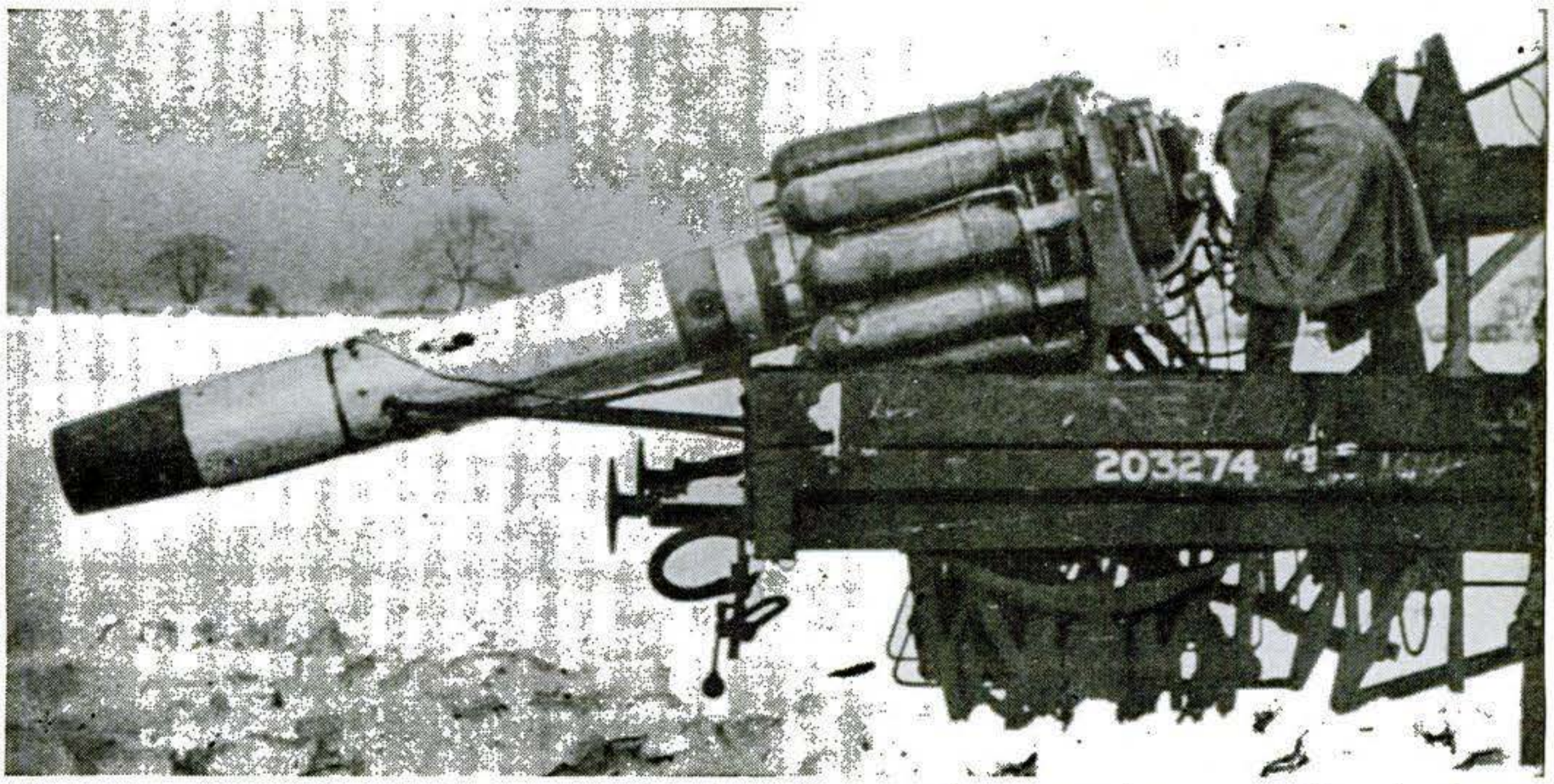
WHEN already overworked jets aren't pushing airplanes, speedboats or racing cars, they are assigned to less glamorous jobs in Britain.

On the River Thames, dredging experts are experimenting with an aircraft jet engine to blast away dock-blocking mudbanks. If successful, the method may prove less costly and more effective than ordinary dredging.

Also a British innovation is the earlier use of a similar jet engine as a railroad snowplow during winter blizzards.



At close range, the jet's powerful blast routs out a 16-foot-long gash in the bare mud in four minutes. British dredging experts are counting on this new method to help whittle down the estuary's fast-growing mudbanks.



Mounted on a railroad flatcar, another jet makes short work of track-clogging snowdrifts. Its hot exhaust can clear away 75 yards of snow from 18 to 54 inches deep in five minutes.

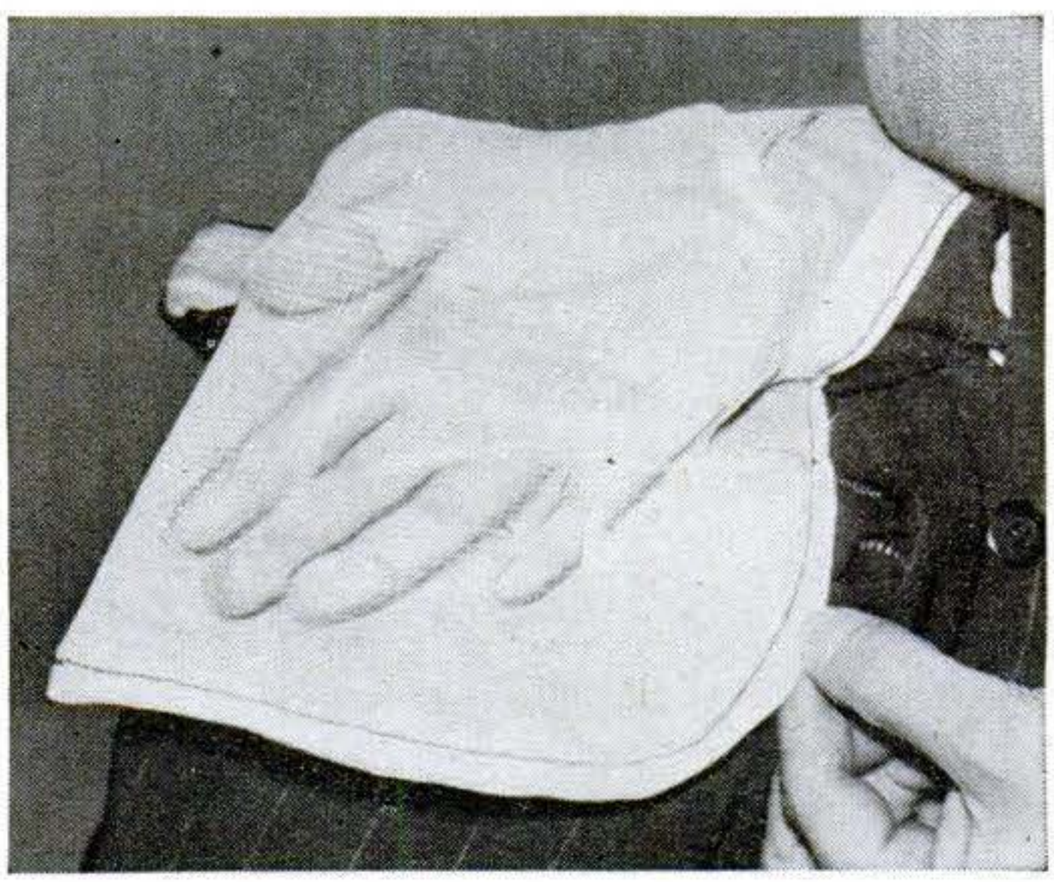
Copyrighted material

AIDS TO MODERN LIVING

Cap Has Pouring Spout. With these new plastic caps, a housewife can make her own canister set from ordinary canning jars. The cap includes a pouring spout which, when not in use, pushes down flush with the top. Made by Jiggs-Penny Corp., New York, the caps sell for 25 cents each.

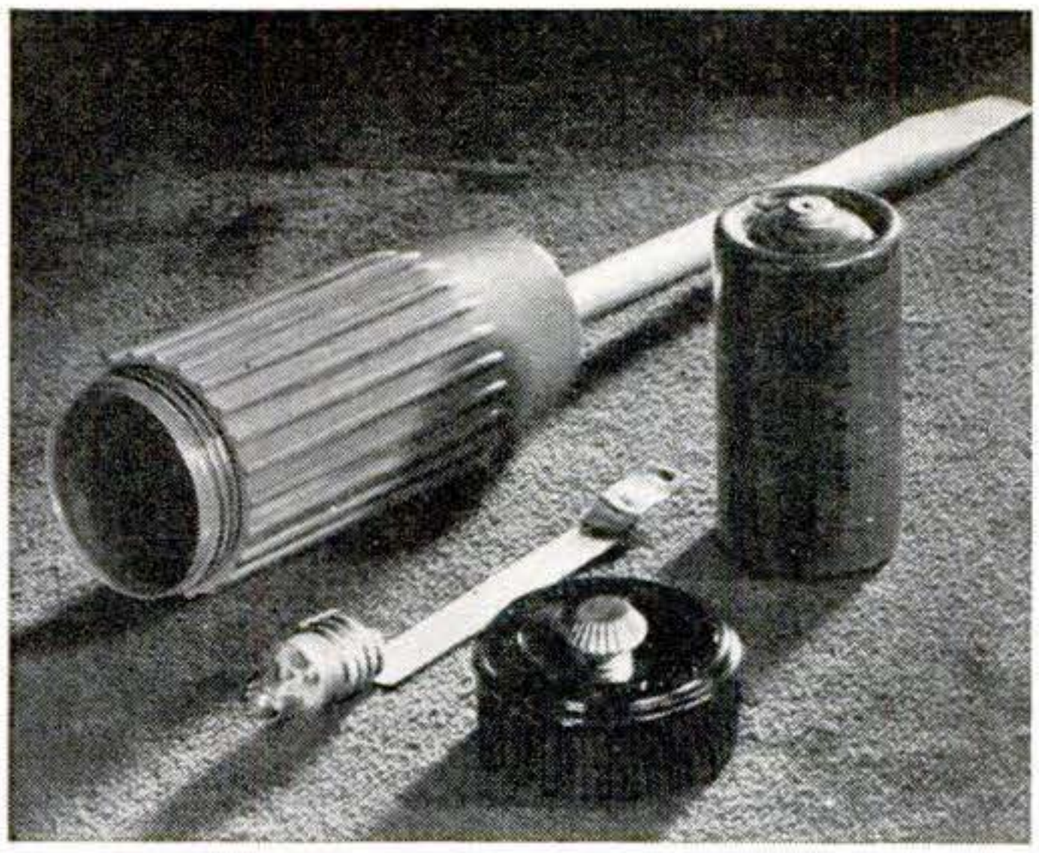
Screens Stored on Rack. Racks on which either screens or storm windows may be stored during the off season are produced by the Barber Manufacturing Co., Minneapolis, Minn. The rack also provides a convenient way of supporting the sashes for painting. Each set holds 21 sashes.

Dial Adjusts Recipes. Changing a recipe to produce more or less than the indicated number of servings usually involves a lot of mental arithmetic. The device above, employing a principle long used in engineering, is said to perform such fractional figuring automatically. When you set the dial for the number of servings you want, it shows how much of each ingredient to use. Recipe-Ralph, Hollywood, Calif., makes it.



Pockets Give Ventilation. According to Joseph W. Lewis, nylon-mesh pockets like the one above would make men's trousers more comfortable in hot weather. A New York engineer, he contends that the mesh permits circulation of air up the leg, thereby helping keep the body cool. In a demonstration, a thermometer in such a pocket registered several degrees less than another in an ordinary pocket.

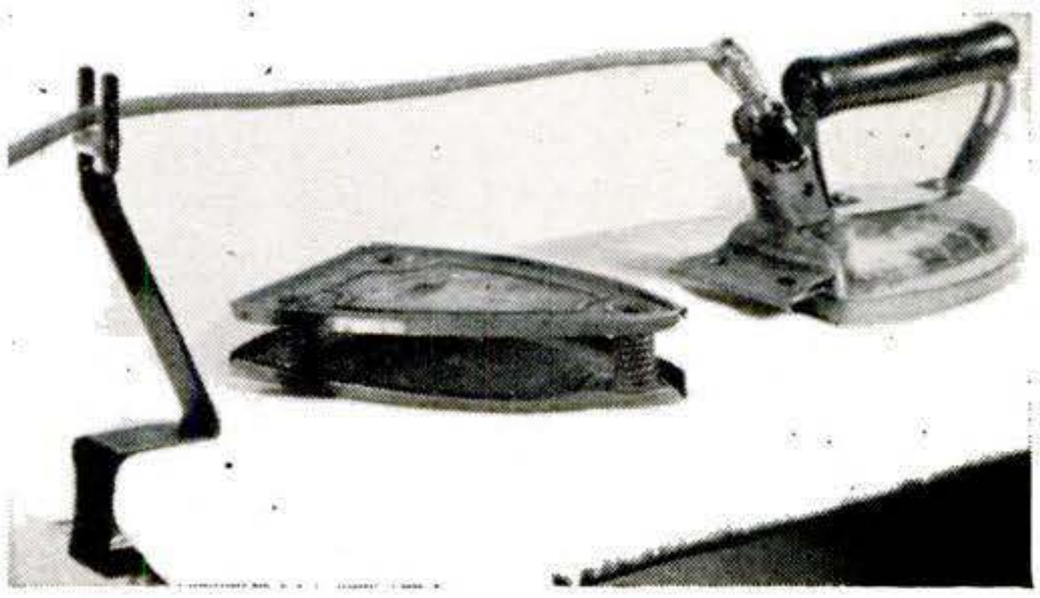
Copyrighted material

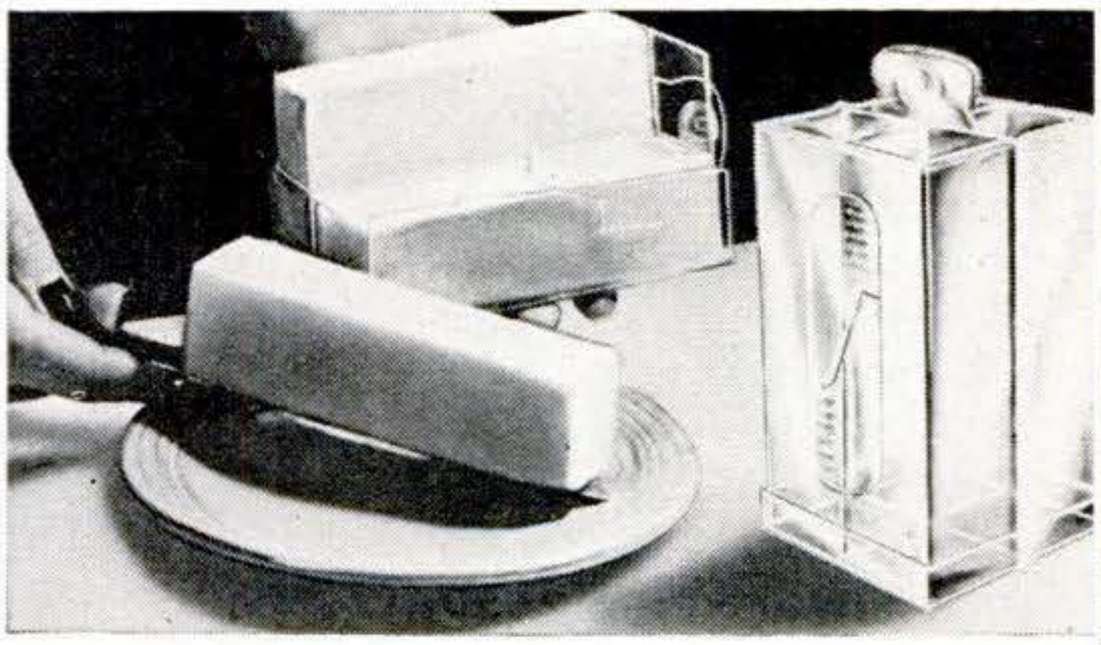


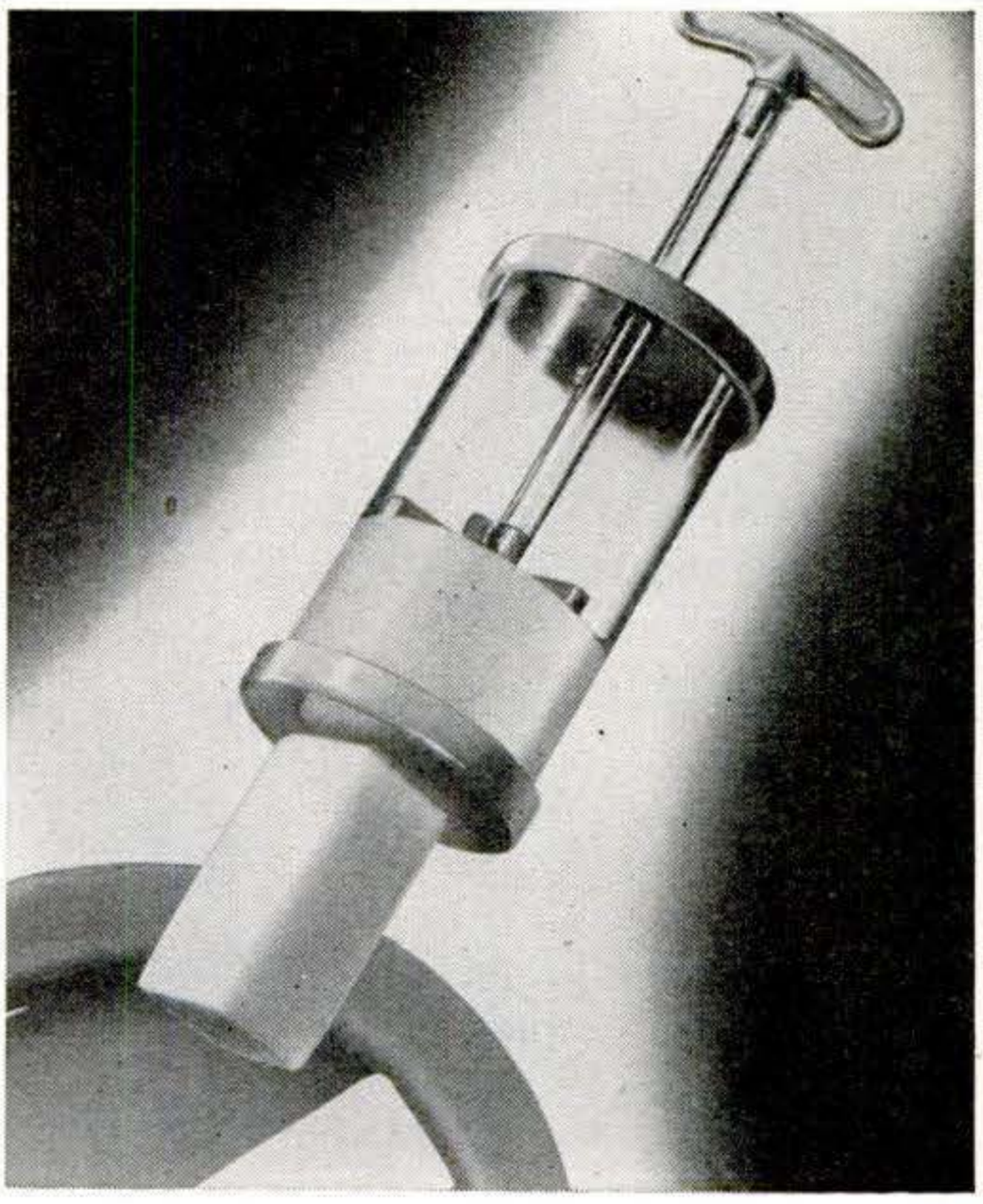
Screwdriver Has Light. A screwdriver made by the Graham Manufacturing Company, of Detroit, Mich., contains a flashlight in the plastic handle, the light focusing directly on the screw head. The screwdriver blade is easily removable, making it possible to use the handle and light on other attachments interchangeably.

Stool Warms Your Feet. Finished in walnut and upholstered in red or blue velvet, this footstool contains an electric heating element to warm your feet. When the warmer is not in use, the electric cord tucks neatly out of sight underneath the stool. Made by Sherrill's, of Roanoke, Va., the stool sells for about $35.

Bracket Supports Cord. An ironing aid placed on the market by the Franklin Fader Company, of Newark, N. J., is designed to keep the cord clear of the board while the housewife is ironing. It consists of a bracket that clamps on the wide end of the board and a small weight that is tied to the cord between the bracket and the wall outlet, the cord riding over a small roller on the top of the bracket. The outfit sells for $1.





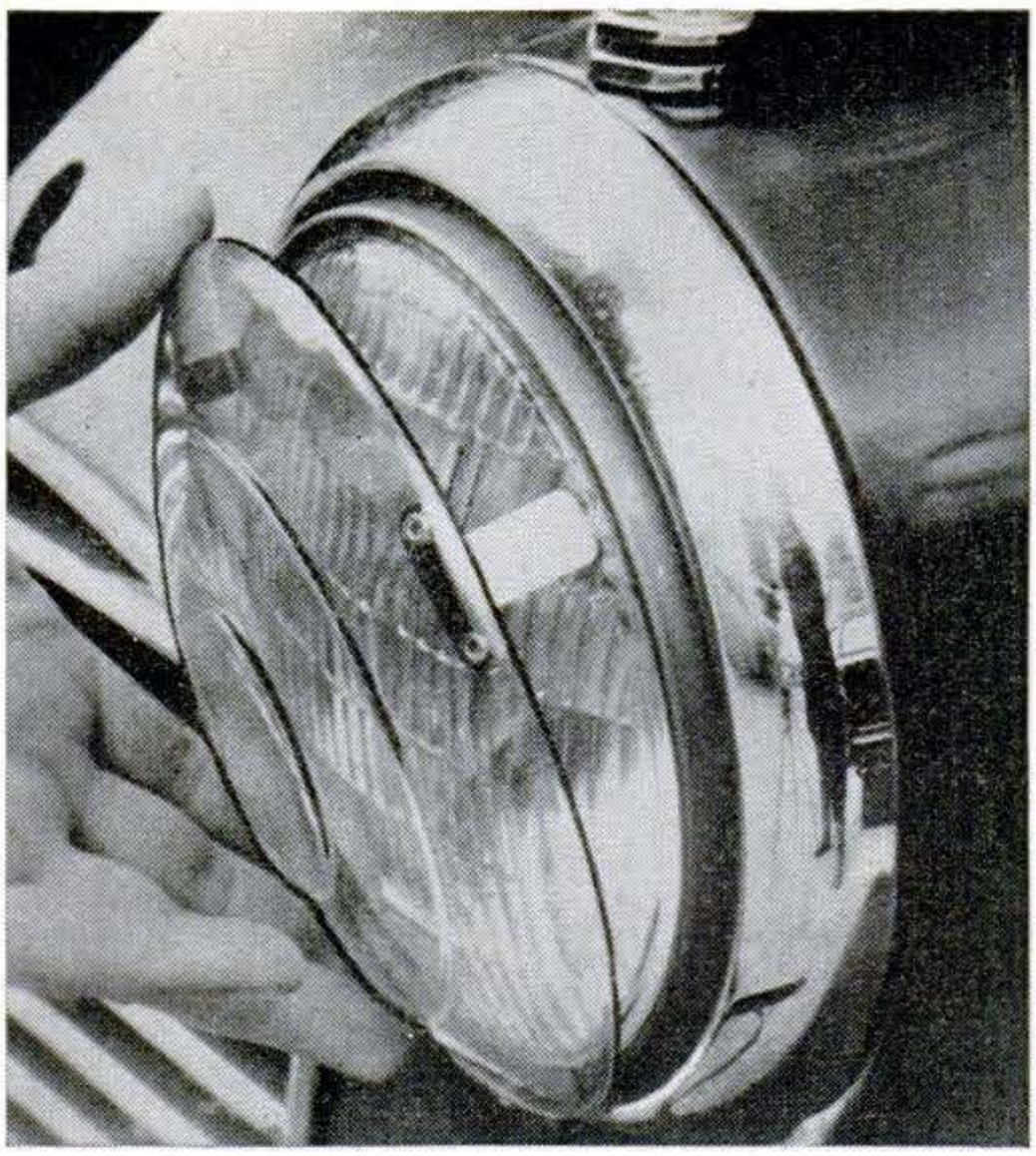


Gadgets Mold Margarine. Two devices for molding margarine or homemade butter into ¼-lb. cubes are seen here. Above is a plastic mold into which the margarine or butter may be packed. This is available from the Royal Distributing Co., Kansas City, Mo. At the right is a combination mixer-molder made by Plastic Molded Products, Inc., Los Angeles. After being mixed the margarine is pushed out a square hole.

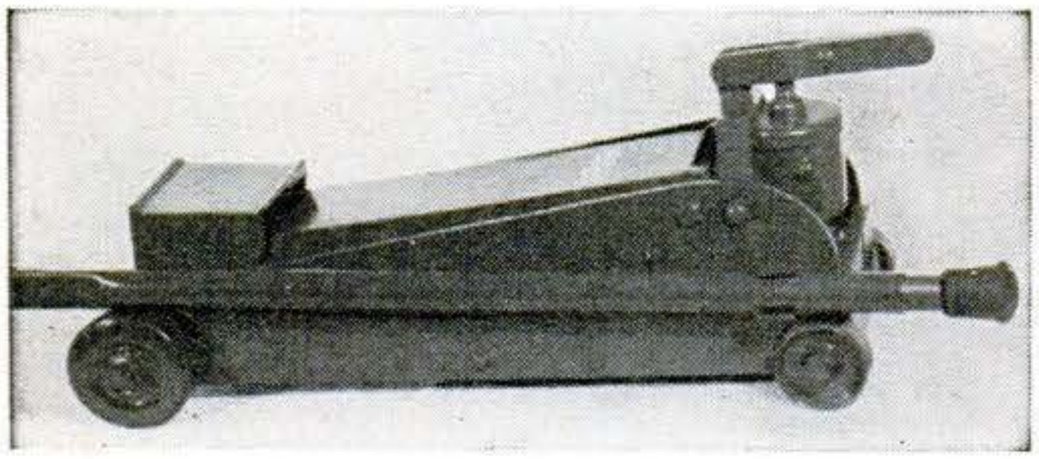
Copyrighted material

AUTO IDEAS

Eliminates Drafts. Even though the front window of a car is wide open, a plastic device made by the NuWorld Products Company, Huntington Beach, Calif., deflects the wind outward, protecting rear-seat passengers from drafts. Installed inside the window by three clips, it does not interfere with normal window operation.

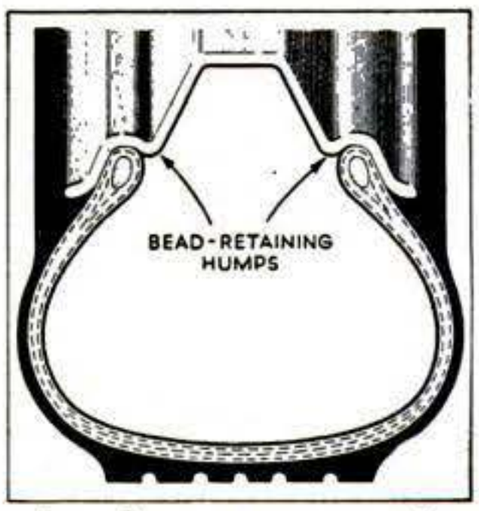


Fog Lens Clips On. Standard sealed-beam units may be converted into fog lamps with plastic amber lenses introduced by Hazelite, Inc., of New York City. By means of three clips, the lenses may be quickly installed or removed without the use of tools when the need arises. They are sold at approximately $3 a pair.

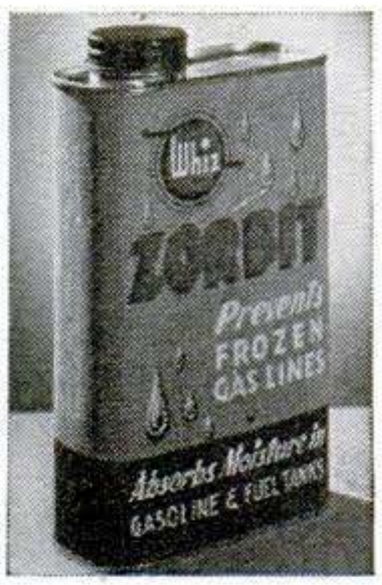


New Hydraulic Jack. Easily carried in the car, a new jack made by Zamax Manufacturing Co., Inc., Haverstraw, N. Y., gives the motorist the convenience of the heavy curb jack used by service stations. The detachable handle telescopes to 28″ for storage. A key in the handle turns the bleeder screw to lower the jack.

Rim Is Safer. A new type of wheel rim introduced on Chrysler-built cars in 1941 but publicized only recently is sketched here. Two barely noticeable humps are designed to keep the bead from slipping into the drop center if a blowout occurs at high speed. Tests have shown that when such a blowout happens, centrifugal force comes into play and the damaged tire acts as if it were inflated. Not until the speed of the car falls to 40 m.p.h. or lower does the tire become flat.

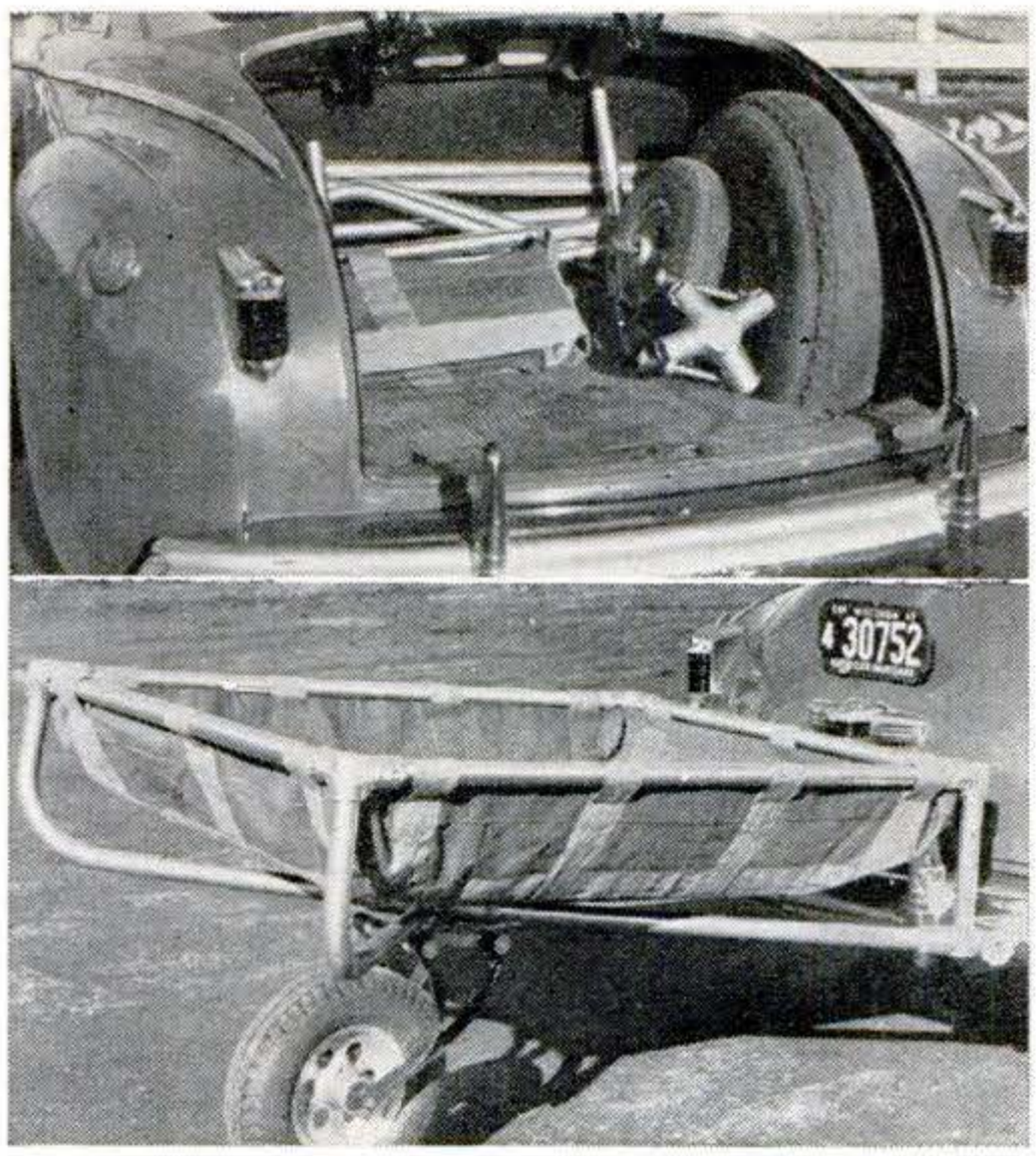


Absorbs Water. A product known as Zorbit, introduced by R. M. Hollingshead Corp., Camden, N. J., is designed to prevent frozen gasoline lines. Added to the gas in the tank, it is said to absorb any moisture that is present in tank or line.

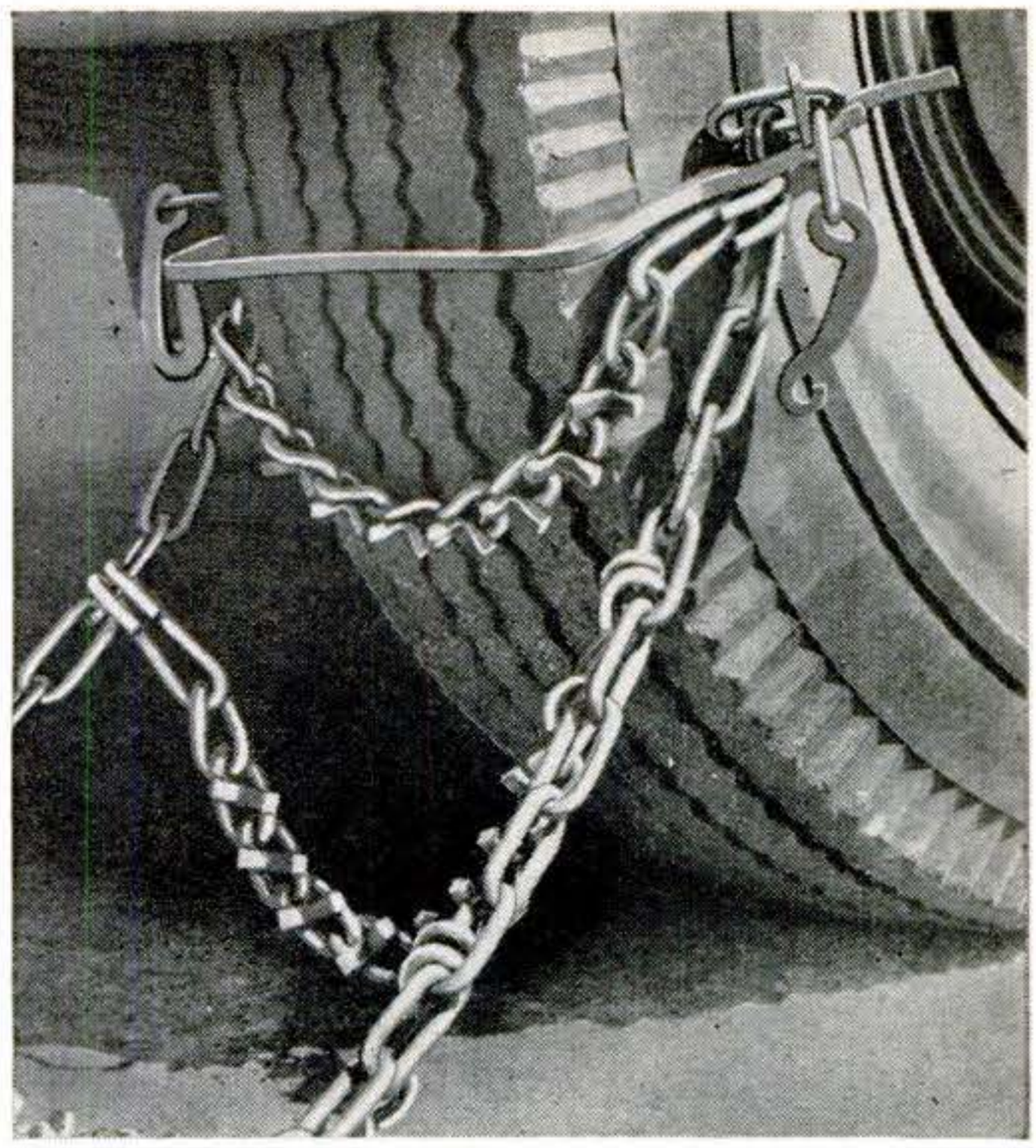


Cams Lock Battery Terminal. A new type of automobile-battery connector made by Thomas & Elton Products, Inc., Williamsport, Pa., includes a cap screw that adjusts the connector to the battery post and two cams that then lock it in position, tapers on the cams corresponding to tapers on the two-part connector body. The manufacturer claims that the connector will not "freeze" on the post.

Copyrighted material

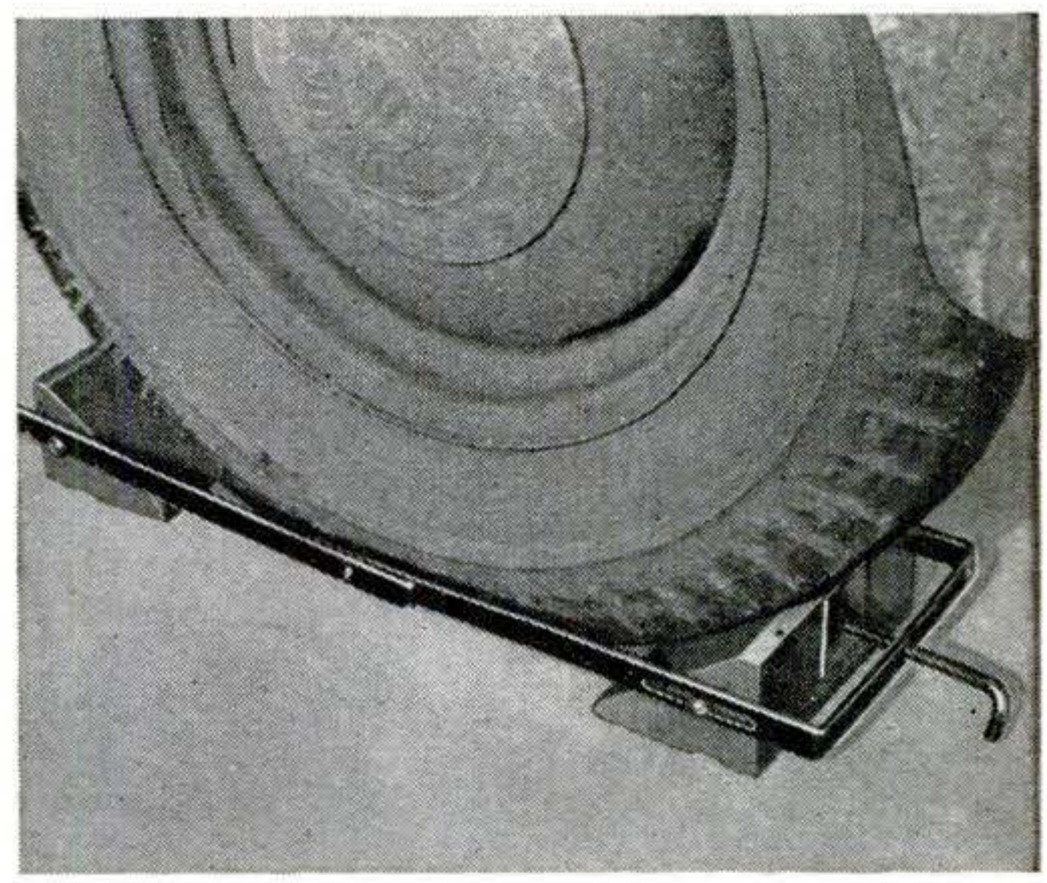


Trailer Is Collapsible. A trailer made by Grosch & Gilmore, Milwaukee, Wis., folds up for storage in the car trunk when not in use. Consisting of a canvas body on a tubular aluminum frame, the complete trailer weighs only 45 lb., but will carry a load of 400 lb. It rides on a single pneumatic-tired wheel, mounted on shock-absorbing leaf springs cushioned in rubber. The wheel operates like a caster so the trailer will follow the car. Two ball hitches attach the trailer to the bumper.



Gadget Helps Put On Chains. A chain attacher made by the St. Pierre Chain Corporation, Worcester, Mass., is illustrated in use above, with the chain stretched out straight behind the wheel and the U-shaped attacher inserted in the side chains and pushed on the tire. The car then is driven forward until the wheel has made one complete revolution and the chain encircles the tire. After the ends are hooked, the job is done. Also in the photo above are special fasteners made by the same company.

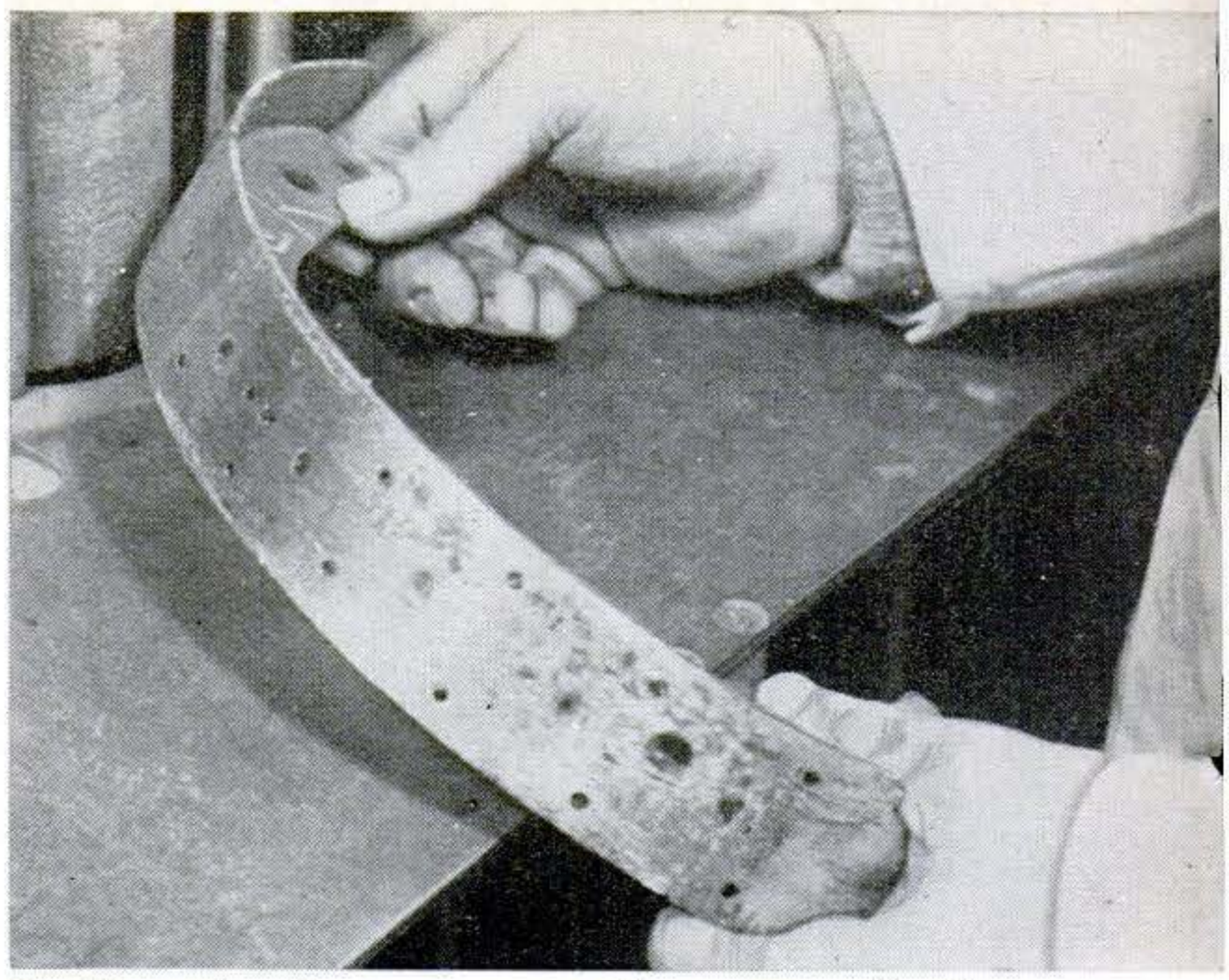
Warns That Brake Is On. A new Ford accessory gives audible warning if you start out without releasing the hand brake. Vacuum operated, it consists of a whistle, a hose and T-shaped unit for connecting to the wiper vacuum line, and a spring to hold the whistle open while the brake is set. It blows only when the engine is running.



Device Blocks Wheel. An adjustable chock introduced by Modern Devices, Inc., Chicago, Ill., prevents a wheel from rolling in either direction. It consists of triangular wooden blocks held together by a metal frame, one block being removable so it can be set in place. A screw tightens the blocks. The frame folds for storage.

Copyrighted material

Rivetless Brake Linings Last Longer



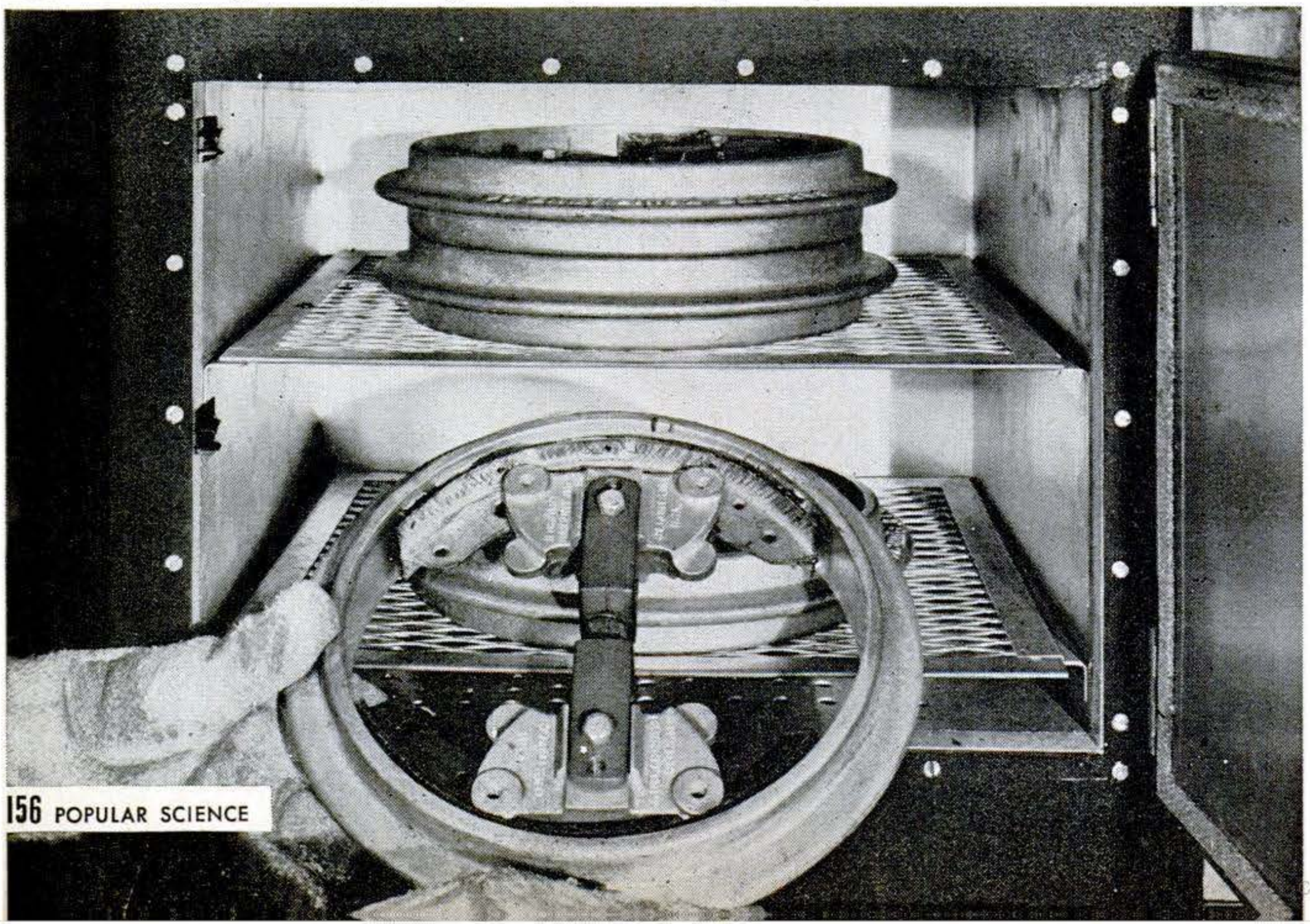
Buffing the shoe to remove dirt, rust, and oil is the first step. A clean surface is needed for a good bond between the lining and shoe.

IF YOUR car should require new brake linings, there is a good chance that the mechanic may suggest bonding them to the shoes, for an increasing number of repair shops are offering such service. By this relatively new process, linings are cemented and heat-bonded on the shoes, eliminating the traditional rivets. Bonding procedures announced by three companies are illustrated here.

According to the Goodyear Tire & Rubber Company, linings installed by its Uni-Bond process can be expected to last twice as long as those that are riveted, since the lining may be worn down to the shoe instead of only to the rivet heads. In addition, elimination of rivets increases the braking surface and lessens the possibility of brake-drum scoring, frequently caused by abrasive material collecting above countersunk rivets.

Thorough cleaning of the shoe face is the first step in any bonding process. In the Goodyear process, cement then is applied and allowed to dry for 20 min., after which lining and shoe are forced together by a specially designed pressure ring and placed in an oven for a specified time. Another bonding method shown here has the cement preapplied to the lining, and a third provides it in strip form that is cut as needed.

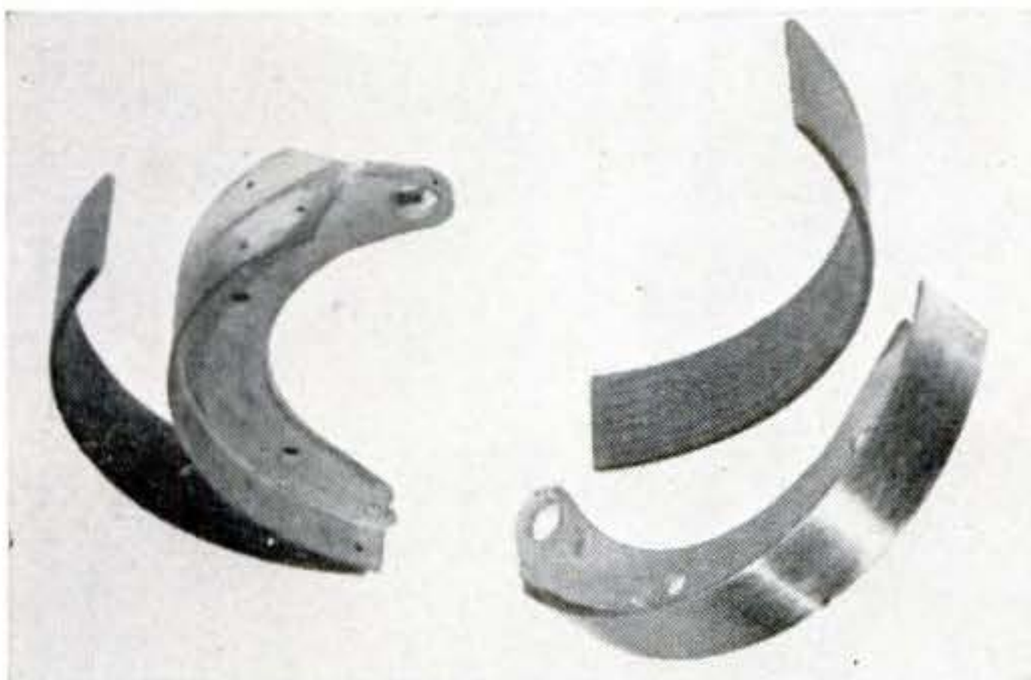
Locked in a ring under great pressure, the linings are placed in an oven for 20 to 30 min.



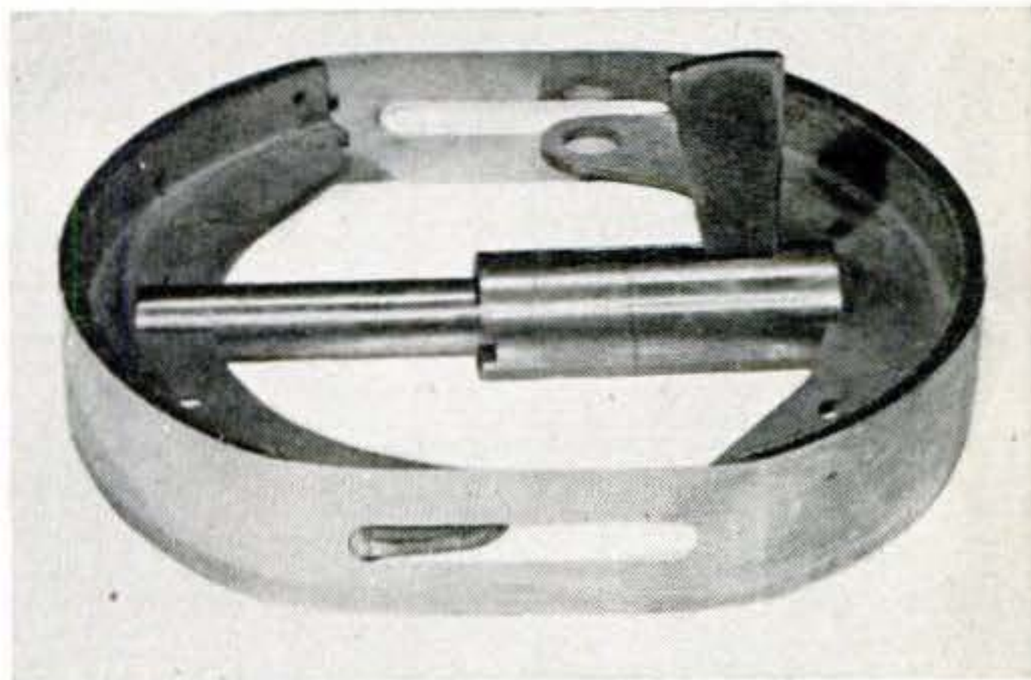
Copyrighted material

Special cement is applied to the clean shoe, left to dry for 20 min., and lining and shoe are then forced together in a pressure ring.

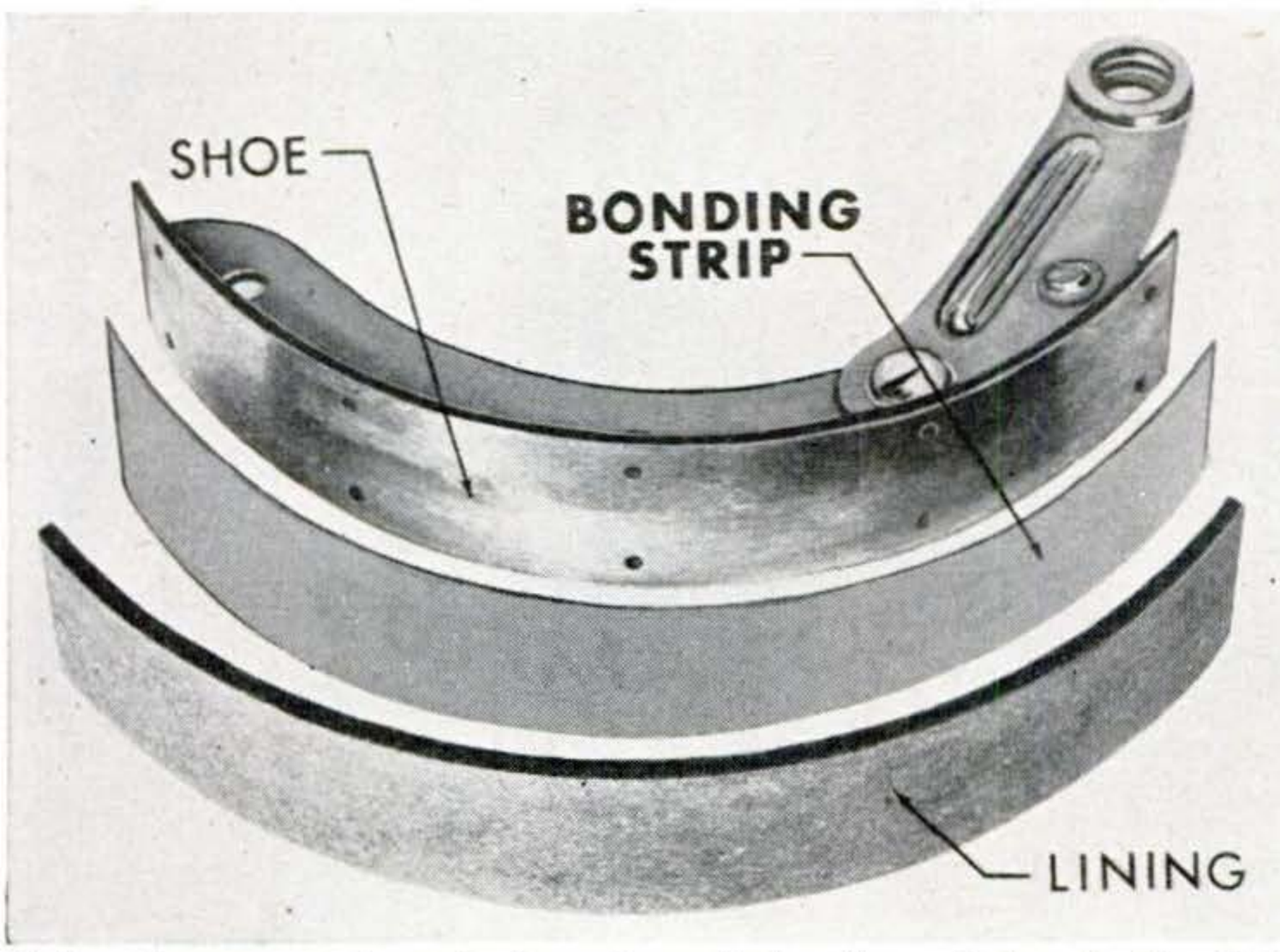
After baking, the lining and shoe have become one unit. Such linings are said to withstand shear pressures of 1,400 lb. per lineal inch.



Lining segments developed by the Grizzly Mfg. Co. come with the bonding agent preapplied.



Pressure rings are of several types. Here a tapered key exerts pressure when driven home.



A bonding agent in strip form is made by the Permafuse Corp., Brooklyn, N. Y. When heated, it bonds the lining to the shoe. Lengths to match the lining may be cut from the roll.

Copyrighted material

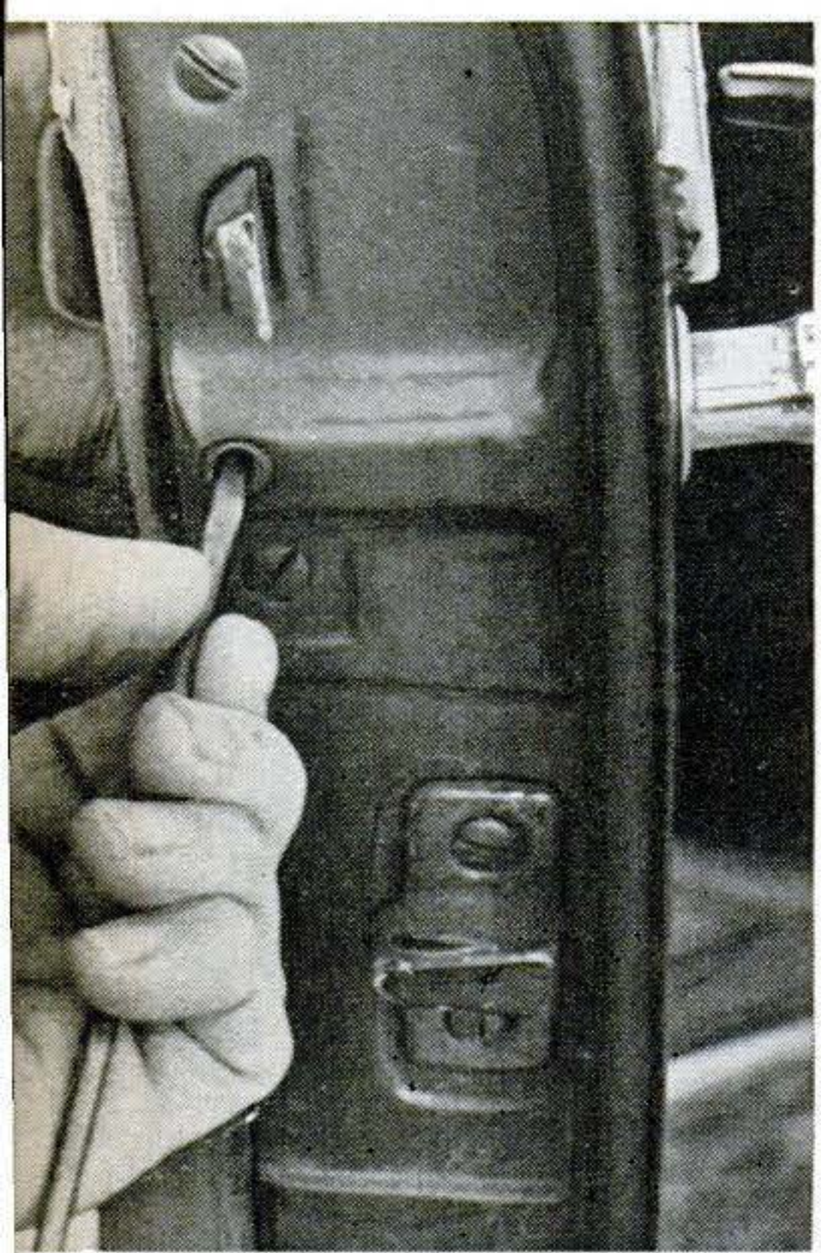
Curing Auto Door Ailments

By Frank McCarty

CAR doors are usually the first things to give trouble when a body begins to wear. They have to be slammed to stay shut. Hinges become sprung. Window glass will not raise and lower easily or far enough. Rattles distract the driver, and latches that hold doors insecurely invite injury to passengers or passers-by. Balky locks cause delays and expose one to weather.

Preventive maintenance on doors, as on other parts of a car, saves hours of bother. It consists simply of regular lubrication. However, when something does go wrong, correct it without delay. How the most frequently needed repairs are made is shown in the photos on this and the facing page.

Stiff lock action or the danger of its freezing in winter can be prevented by a squirt or two of powdered graphite from a spray-type dispenser.

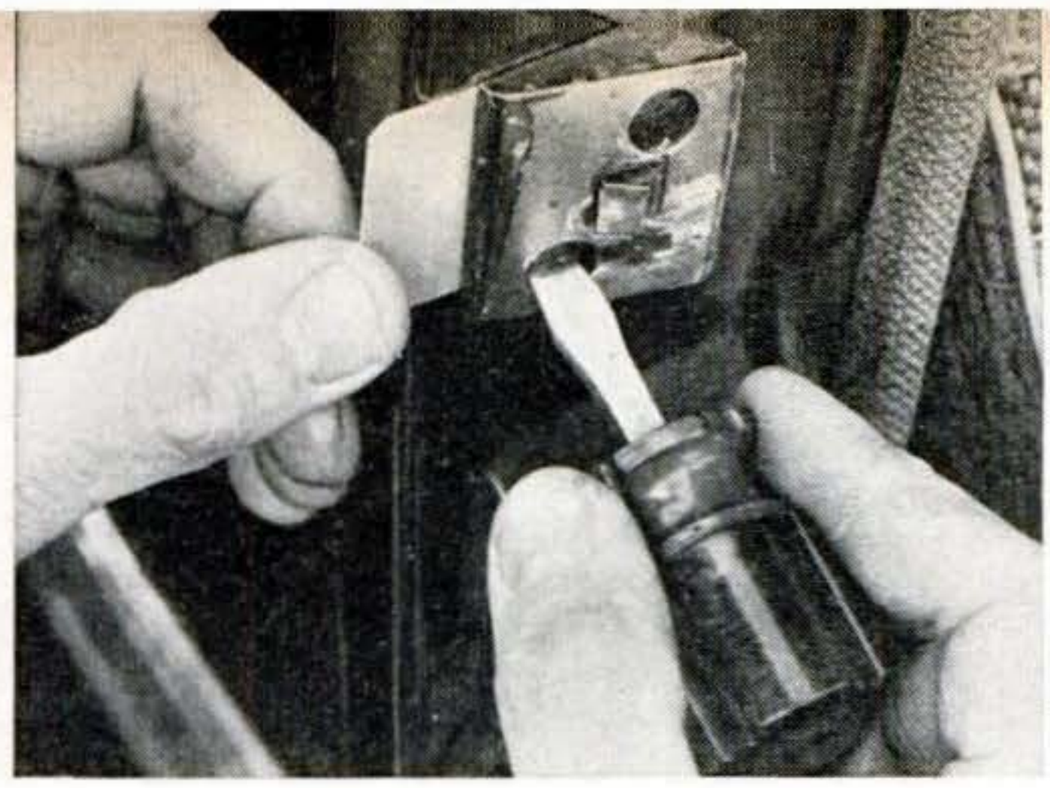


Door handles of this type are removed by loosening one setscrew in the edge of the door. Once out, the handle can be disassembled and the lock barrel removed if it should require adjustment, repair, or replacement.

Separate lock units located under the handle are also held in place by one setscrew. When a lock barrel of this type is being replaced, a wire is inserted through the setscrew hole to help guide the square shank into the lock. Be sure to turn the setscrew down flush when it is put back.

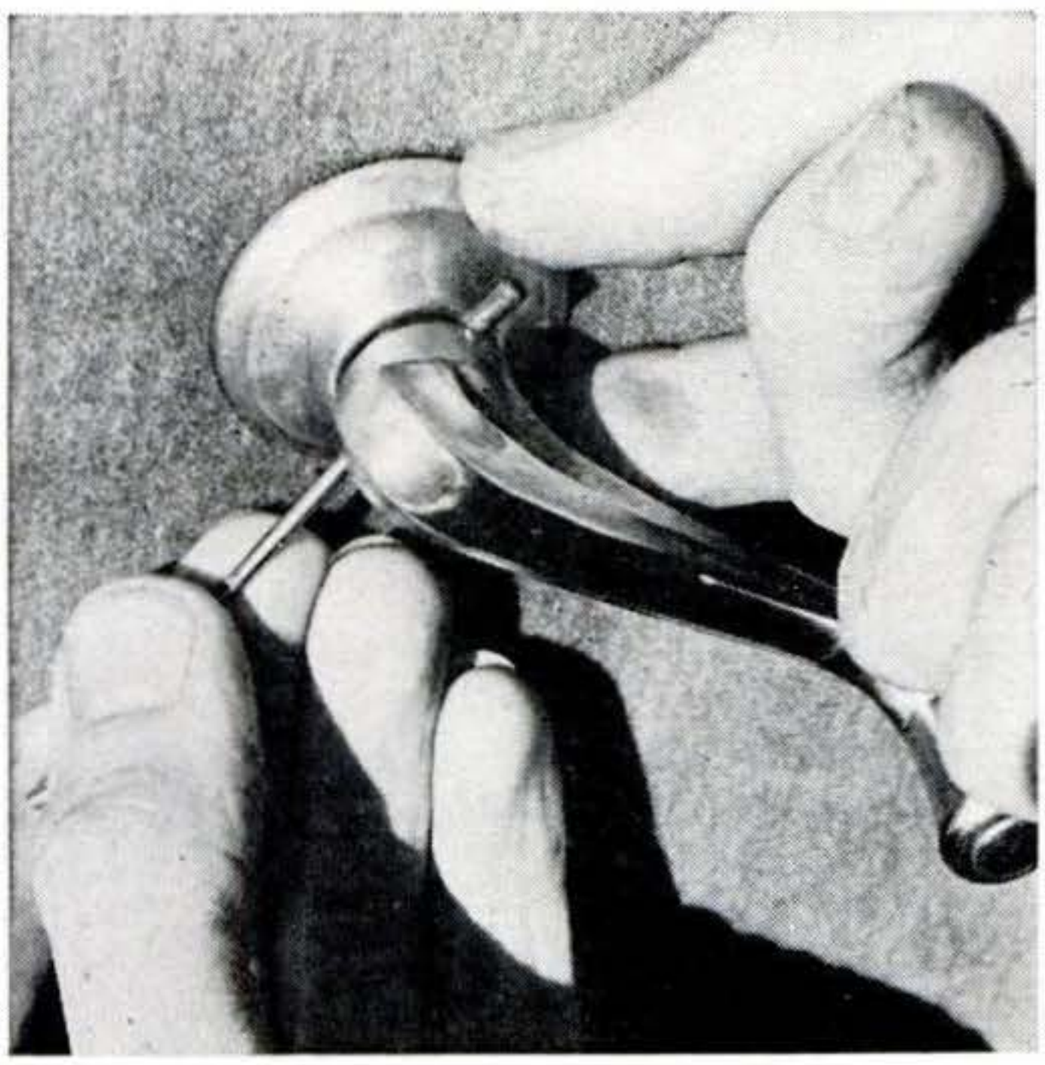
Jamb strikes require lubrication with stainless graphite, which may be had in the convenient pencil shape. The strike shown has rubber insets that can be replaced by removing the two screws.

Copyrighted material



Worn-down latches are adjusted quickly with a metal shim set in behind the strike. Loosening the screws will permit inserting the shim.

Concealed hinges are oiled from the inside of the open door. Close examination will usually disclose an oil hole in the hinge.



Inside handles are removed by depressing the escutcheon ring and pushing out a pin or clip. The handle is then slipped off the shaft.

Upholstery panels can be pried off with a wide putty knife. Press the blade against the spring clips or nails to avoid ripping the material.

Lifting mechanism is revealed with removal of the door panel. Scrape dirt and grease off the rails and relubricate with a graphite pencil.

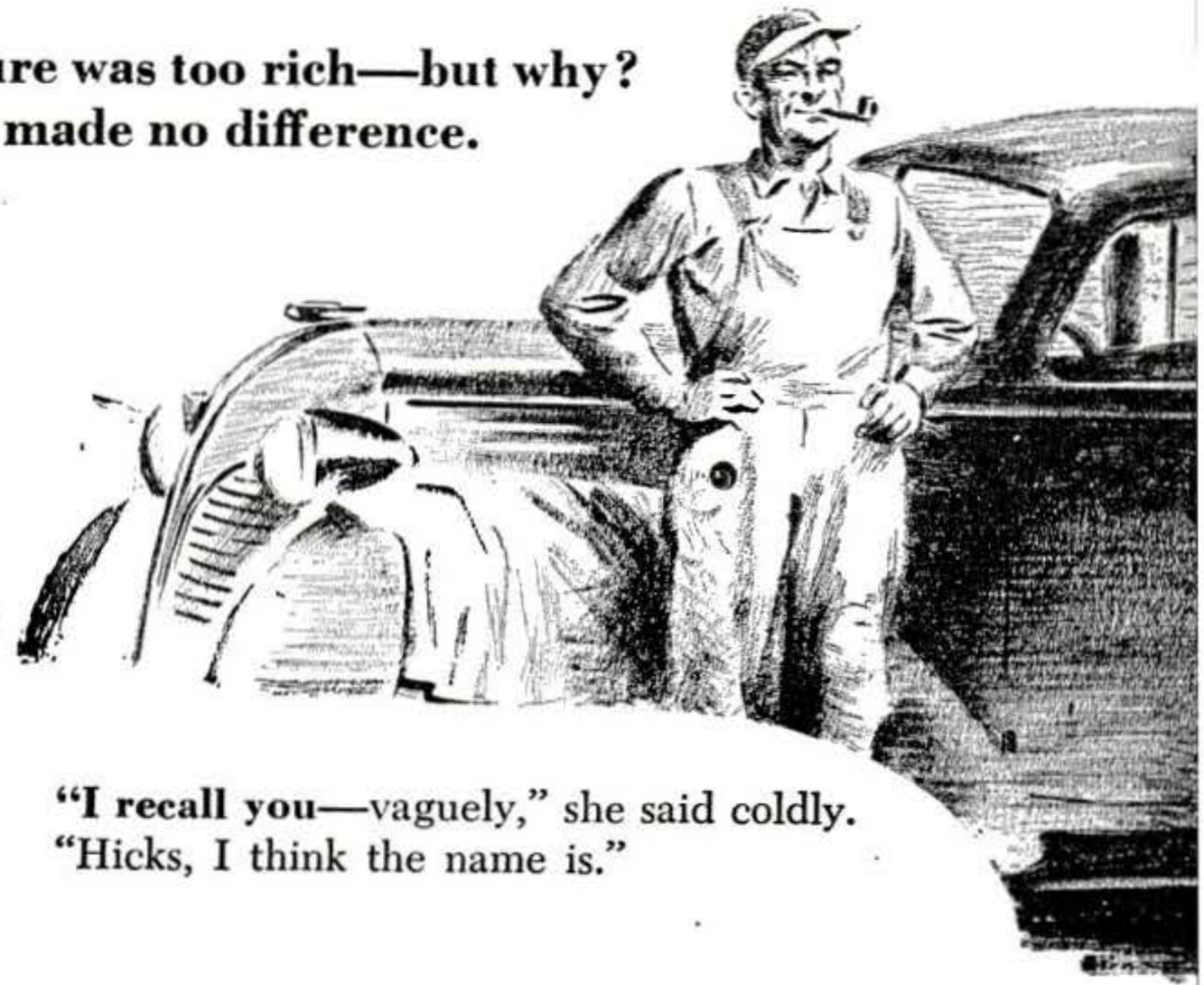
Removal of the mechanism is possible after lowering and taking out the glass. The spring on the gear at right acts as a counterbalance.

Copyrighted material

Gus Spots Double Trouble

Anyone could see the fuel mixture was too rich—but why? Cleaning and adjusting the carburetor made no difference.

By Martin Bunn



"I recall you—vaguely," she said coldly. "Hicks, I think the name is."

STAN HICKS nudged his employer. "Here's Old Man Trouble himself!" he said. Gus Wilson looked up. The driver was just getting out of an old but well-kept sedan he'd stopped in the center of the Model Garage shop floor. His thin face was creased with chronic dissatisfaction.

"Hello, Vern," Gus greeted him cheerfully. "Haven't seen you for a dog's age. Where've you been keeping yourself?"

Vernon Hopkins almost shouted. "There never was a time when a man got as little for his money as he does today. Look at my car. I've had it in three shops—and there's still something wrong with it."

He had left the engine running. Gus noticed black smoke drifting out of the exhaust pipe, and his nose detected unburned gasoline. "I don't know what else is wrong with your bus," he said, "but your carburetor is certainly out of adjustment."

"Now, ain't you smart!" Vern's voice dripped mock admiration. "All three of those boneheads who worked on my car figured out there was something screwy about the carburetor—but not one of them had any idea what the trouble is. And I'll bet you can't find out either."

"What'll you bet?" Gus challenged.

"Anything you want," Vern growled.

"Okay," Gus said. "Tonight's supper."

"Well—all right," Vern agreed. "Now what are you waiting for? Find out what's wrong—and fix it. I'm in a hurry."

"You're not our only customer—thanks be!" Gus replied. "Three other jobs came in ahead of yours—and will have to go out ahead of it. Come back at four o'clock. I'll have your bus ready."

"Four o'clock!" Vern howled. "What am I supposed to do until then—walk?"

"It'll do you good," Gus said.

Vern stalked out.

BEFORE Gus got to Vern's car it was nearly two o'clock. Then he took it out for a road test. After driving slowly for a few blocks he suddenly stepped hard on the accelerator. The engine choked and missed. Keeping the accelerator pedal down, he threw out the clutch. Instead of speeding up, the engine continued to miss and sputter. "Carburetor out of whack, all right," he thought, as he turned back toward the Model Garage. Before he got there the engine was beginning to overheat. "Just what I thought—too rich a mixture," he told himself.

He drove into the shop and sat for a few minutes listening to the engine's noticeably rough idling. Then he switched off the ignition, removed the carburetor, carried it over to his bench, and opened it.

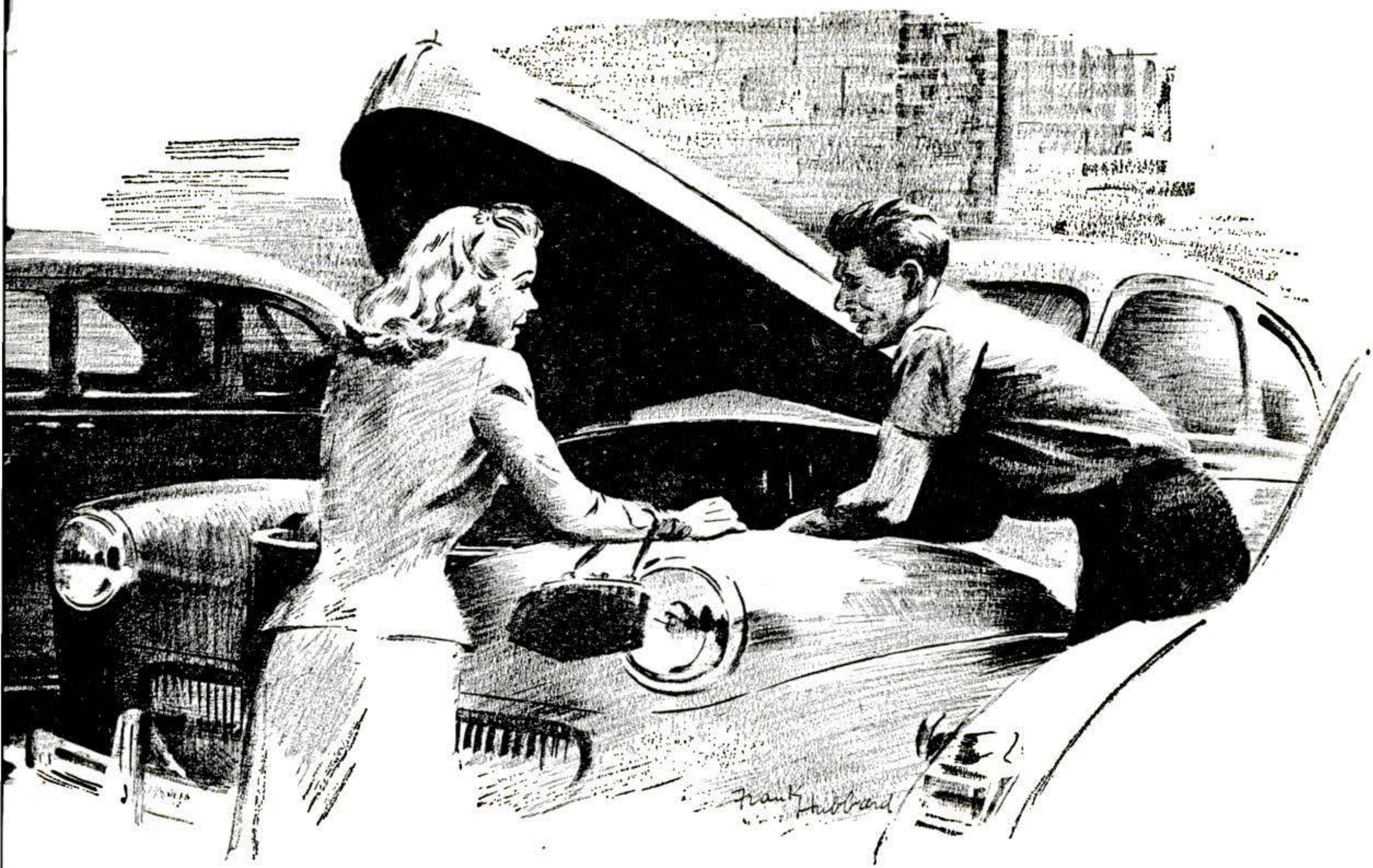
It was one of those carburetors that have the float, hinge mechanism, and needle valve all mounted on the upper body, the latter in turn being mounted, over a gasket, on the bowl.

Disassembling the carburetor, Gus set to work to clean all the parts. As he did so, he checked each carefully, giving the float particularly close scrutiny, but found nothing either damaged or badly worn. So, after blowing out the passages and jets with compressed air, he reassembled the carburetor and put it back on the car.

Just as he finished, his partner Joe Clark called from the office door. "Hey, Gus! Mr. Morgan is here about that motor-rebuilding job. Come in, will you?"

Gus looked at the shop clock. It was al-

Copyrighted material



most three. He wanted to have Vern's car ready by four, and the chances were that Mr. Morgan would take a half hour.

"Stan," he said. "Take out this Hopkins job and road-test it. I've cleaned and checked the carburetor, and it should be all right—but make sure."

Gus was back in the shop when Stan drove in, shaking his head. "Somethin' still wrong," he reported. "The engine doesn't run like it ought to, and it overheated."

He could add nothing to that report. Now thoroughly puzzled, Gus jumped into the car and drove out.

The engine acted just as it had before. He hurried back to the shop and quickly checked the ignition and fuel line, but there was a good hot spark at each plug and the gasoline flowed normally. "Must have missed something," he muttered, and again removed the carburetor, disassembled it, and began rechecking.

Half way through the job he was interrupted by a feminine voice that asked crisply: "Is my car ready?"

Gus looked up. The young woman's costume nicely set off an effectively streamlined chassis, and her pert face expressed determination to have what she wanted.

"Your car?" Gus asked. "Do we have it?"

"My father's," she snapped. "I'm Miss Hopkins."

Stan raised his head from the car on which he was working. "You don't mean you've grown up from that little Susie Hopkins who tried out for cheerleader in her freshman year—and didn't make it!"

The girl turned and leaned against the car. Smiling acidly, she looked Stan over with the expression of a scientist who has just discovered a new, but uninteresting, species of insect.

"Looking back at that horrible high school," she said coldly, "I seem to recall you—vaguely. Hicks, I think the name is. You were on the football team, and it was your fumble that let Millbridge High beat us for the first time in 13 years."

Stan's ears got red. "The wind—"

"The wind—" she mocked, making a derisive gesture with both hands. Then she turned back to Gus. "What I want to know is—is my car ready?"

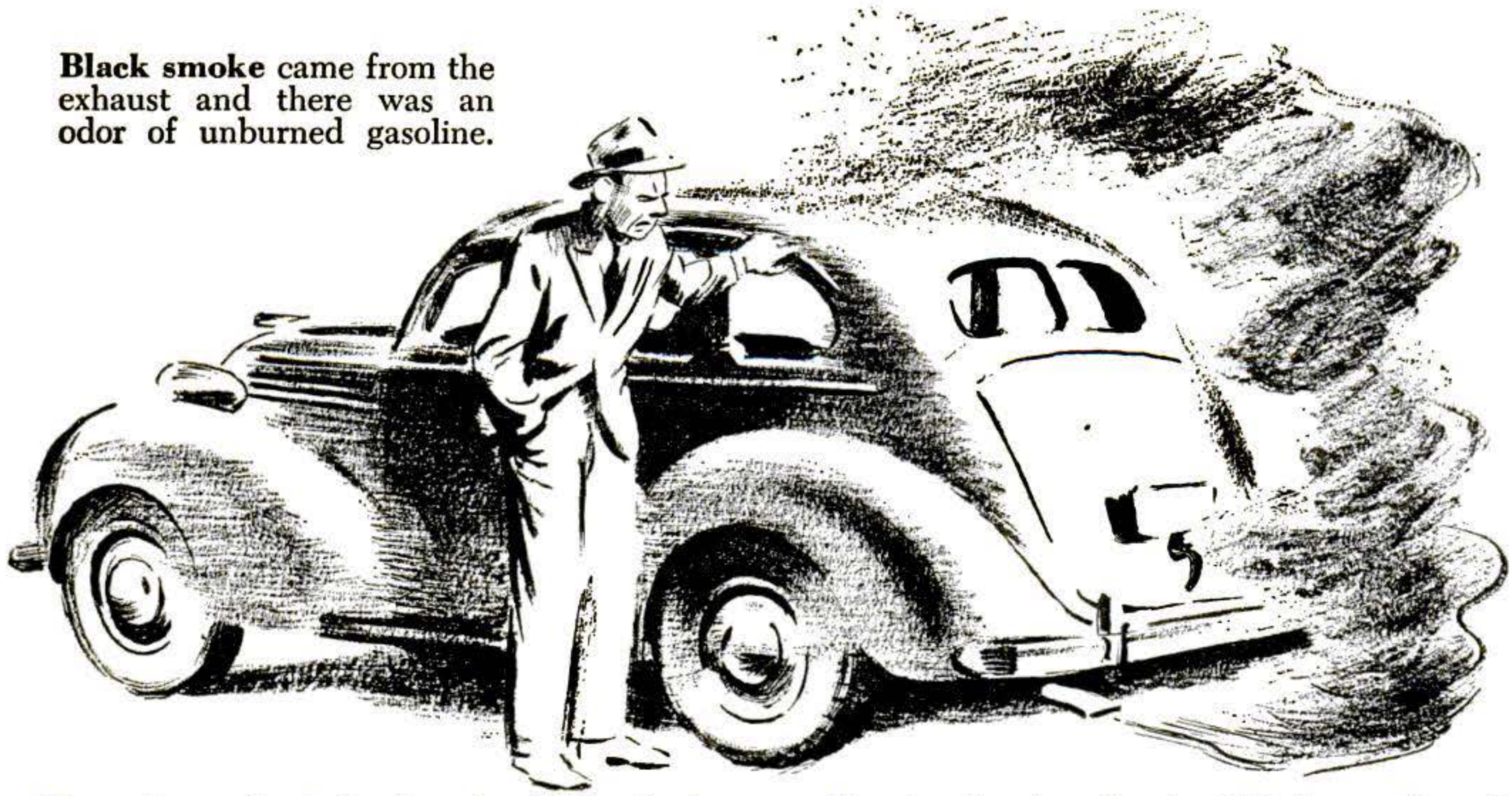
"Nope," Gus replied.

"But Dad said you'd promised to have it ready by four!"

Gus nodded toward the clock. "It's only twenty to four."

"I'll wait, then," she said, perching her-

Copyrighted material



Black smoke came from the exhaust and there was an odor of unburned gasoline.

self on the end of the bench. "What's the matter with the old wreck?"

"Carburetor," Gus said.

"Again?" she asked. "I haven't heard anything but 'carburetor' ever since Dad put that new gasket on it."

Gus looked thoughtful. "So your father did that job himself?" He examined the soft fiber gasket carefully. Then he placed it on the bowl and fitted the upper body of the carburetor over it, bringing the drop light closer so he could see better.

"There's nothing wrong with the gasket or its fit," he said after a moment. He lifted off the upper part of the body. "It's all—" Gus abruptly stooped over and whistled softly. Then he removed the gasket and took the bowl to the window. After examining it carefully, he took a penknife from his pocket, scraped the top of the bowl, brought it back to the bench, quickly put the carburetor together, and reinstalled it on the car. Then he stepped on the starter. The engine ran smoothly.

It was one minute to four. "There's your car, Miss," Gus said. "Tell your father I had it ready on time."

"You can tell him yourself," Miss Hopkins said. "He'll be here soon. I was going to drive him home, but I'm overdue for tea at the Van Name's and can't wait."

As she got into the car, she turned to Stan. "You might drop in some evening. It would be quaint hearing about what happened at that old hick school after I left."

Stan grinned. "Well," he said, "I've got Friday evening open."

She let in the clutch. "Call me first—I might be busy."

LOOKING as grouchy as usual, Vern Hopkins charged in a little later. "Where's my car?" he demanded.

"Your daughter took it," Gus said.

"What?" Vern howled. "Now I'll have to walk some more."

"That's what she said," Gus replied.

Vern's face softened. "Well," he said, "you have to let the kids have their way. By the way—you didn't find out what's the matter, did you?"

"Yes, I found it—and fixed it." Gus grinned. "You caused the trouble yourself when you put on that new gasket."

"Nonsense!" Vern snapped. "There's nothing wrong with that gasket."

"That's right," Gus said. "But when you put on the new one you didn't take off the old one. You didn't notice the old one because it was bonded to the carburetor bowl by pressure and heat and because it had become so discolored that it looked just like the bowl. I didn't spot it until I happened to shine a light on it."

"Well," Vern objected, "how could an extra gasket cause all that trouble?"

"On your carburetor," Gus explained, "both the float and the needle valve are mounted on the upper body—lid to you. The extra gasket raised the float and valve seat, and so raised the gas level in the bowl—just enough to make the fuel mixture too rich. That, of course, caused choking and missing and overheating of the engine. Now, how about that supper?" END

Copyrighted material

Mechanics and Handicraft

Build Your Own Multimeter PAGE 204

Winged Box Kite PAGE 170

Using Your Drill Press PAGE 176

Model Hilsch Tube That Works PAGE 190

Homemade Photo Speed Flash PAGE 198

Copyrighted material

Guest Tray and Mug Hammered on Wood Form

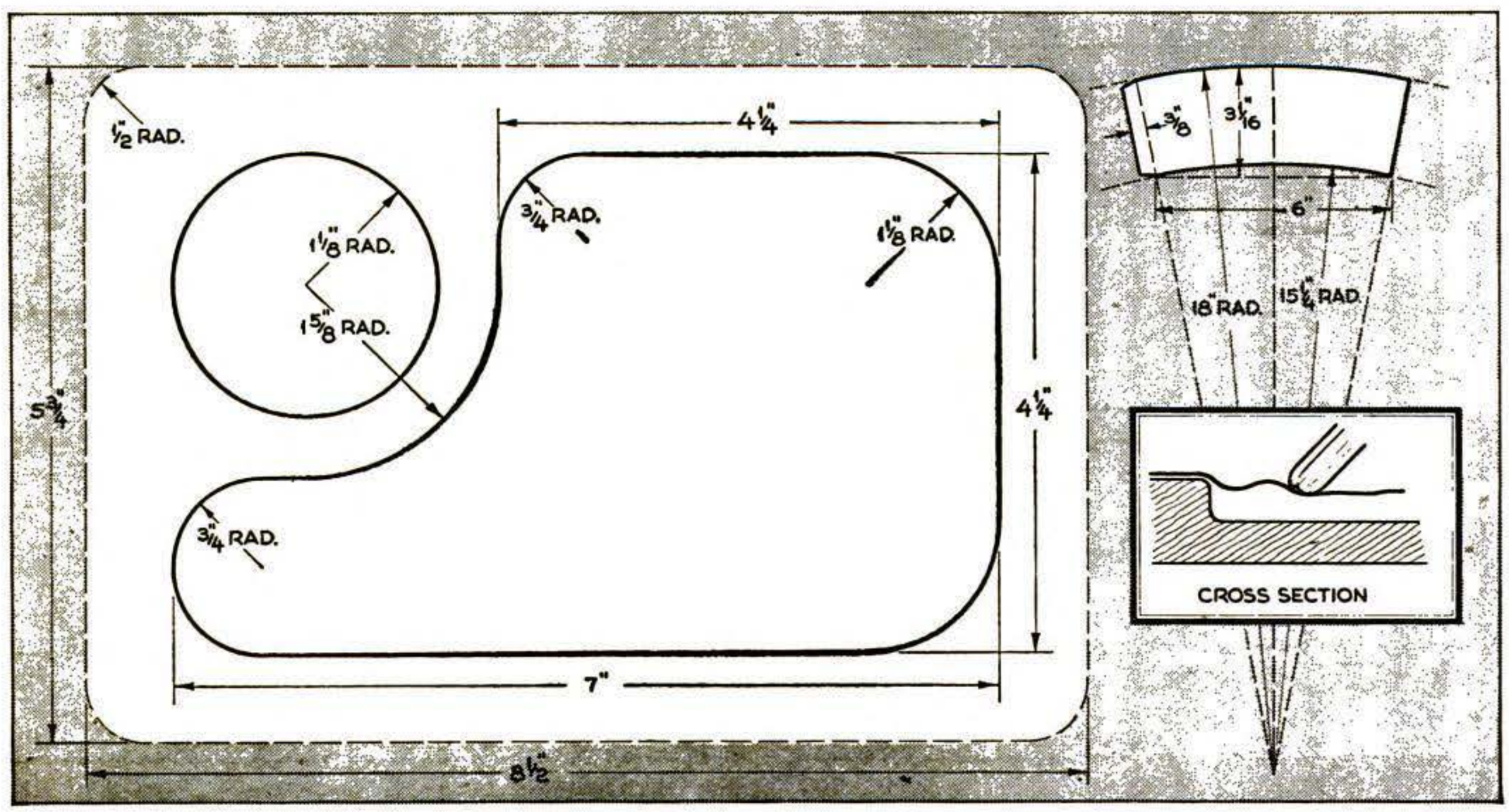
By Morton Bartlett and James Harris

FORMED from soft copper and given an antique finish, a set of these individual serving trays and matching mugs or cups makes a gift that should please any hostess.

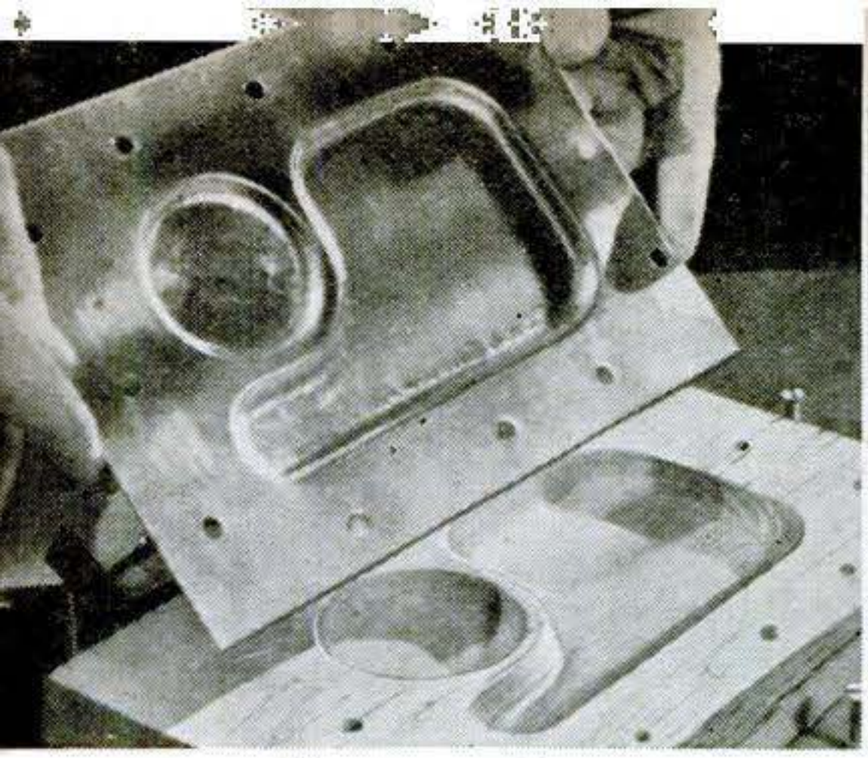
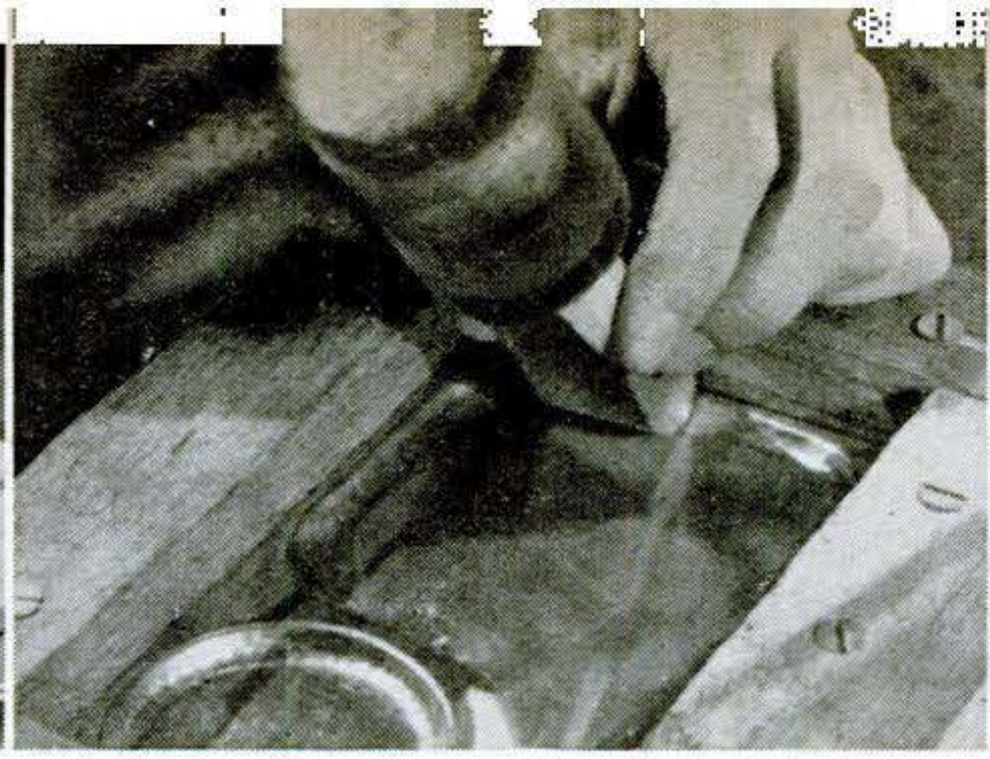
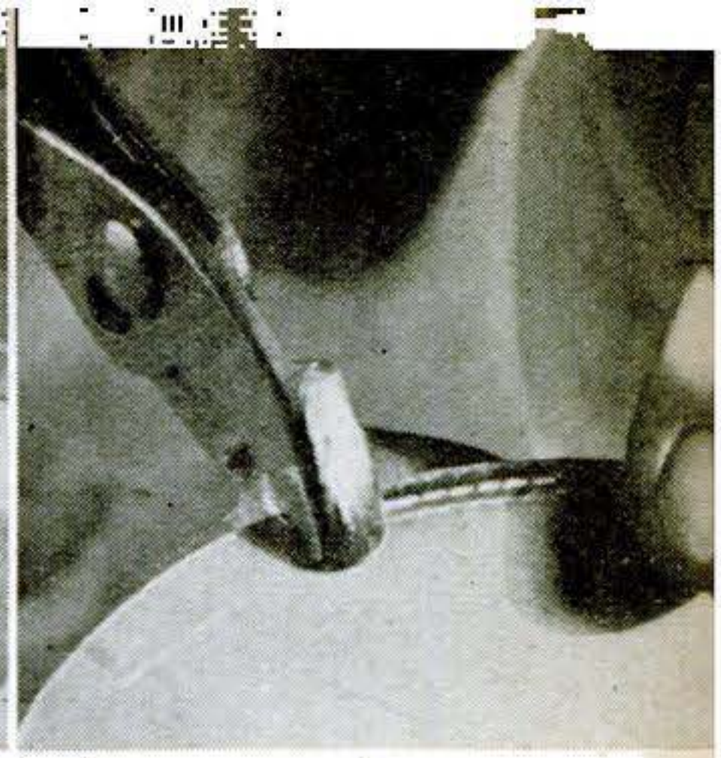
Make the tray mold or form of a 2″ by 10″ by 12″ block of hardwood, carving or routing the recesses to a uniform depth of about ½″. Also cut four clamp blocks ¾″ or 1′ by 1½″ by 7″ and drill so they may be screwed to the form at the edges of the recesses to keep the copper sheet firm. Whittle two pine wedges 1″ by 1″ by 4″ for hammering the metal, giving one a straight rounded tip and the other a curved rounded tip.

Cut a 7″ by 10″ rectangle from soft 16-oz. (24-gauge) copper and drill holes around the edge to match those in the clamp blocks. In forming the copper, use the straight-tipped wedge for straight lines and convex curves and the other for corners and the mug seat. Begin hammering about 1″ away from the ridge between the mug seat and the sandwich section and work toward it, as illustrated in the cross-section detail. In this way, a wave of copper will precede the tool and provide stock to expand into the recess without pulling material away from the cavity on the other side of the ridge. Work down all edges gradually and evenly, going around and around until a satisfactory depth is achieved. No annealing should be necessary.

Remove the hammered sheet from the



Copyrighted material

Hammer the tray on a wood form, clamping the copper sheet with four holding blocks before driving it into the recesses with pine wedges. Then lay out and scribe the outer edge, inside the drilled holes, and shear away the waste. A decorative bead may be applied to the edge with an inexpensive pair of pliers that have been adapted for use as a chasing tool.

mold, scribe the outline indicated by the dotted line in the drawing, and shear off the waste. In this case, the bead was made with a rivet crimper used as a chasing tool. Alternatively you can use a pair of pliers ground so that there is a bead on one face and a notch on the other (PSM, Sept. '47, p. 168).

The pattern in the drawing may be used either for a cup or mug, depending on which end is closed. Roll the copper with the fingers, drill the edges, and then rivet and solder the seam, preferably with silver solder since soft solder is not ideal for receptacles that are to contain drinks. Should copper rivets be unavailable, you can substitute 7/16″ No. 4 copper tacks by snipping off segments of the head, inserting in the hole, cutting to length, and peening.

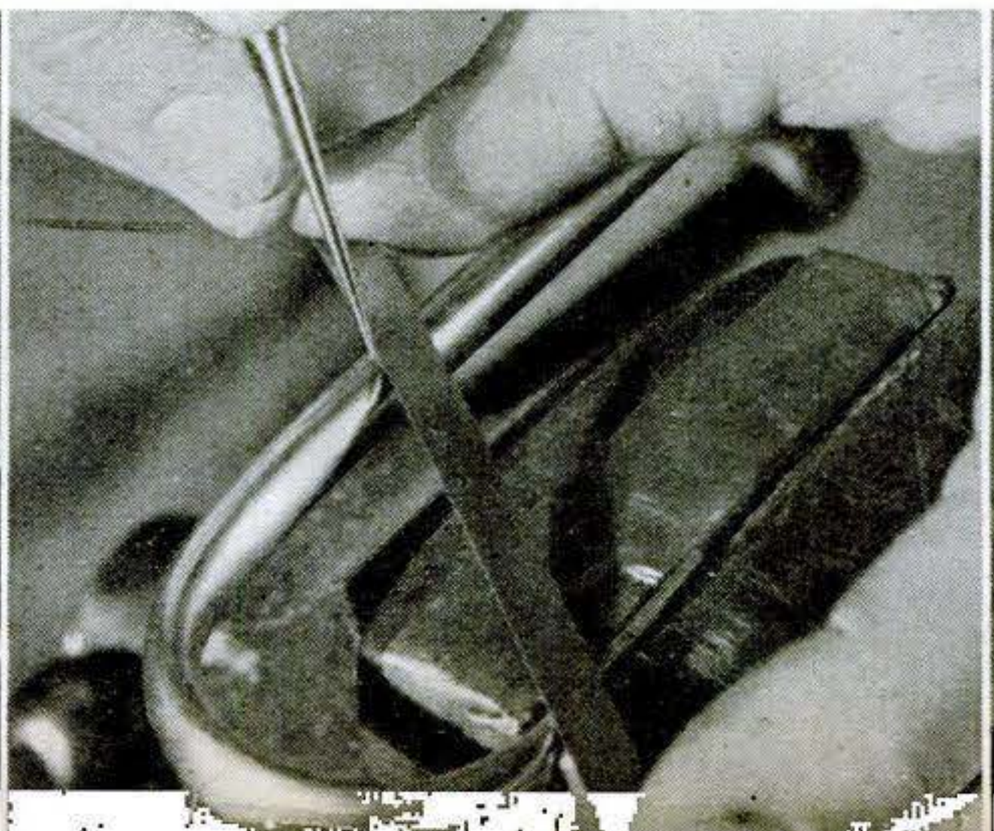
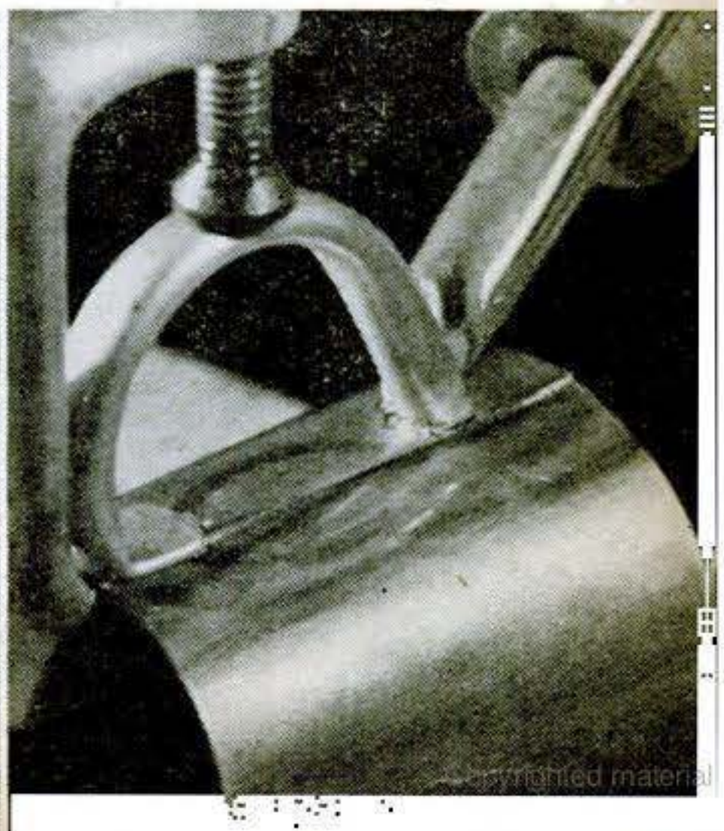
If possible, solder the bottom and the seam at the same time. For the cup, the bottom has a flared, crimped edge produced with the same pliers or staking tool used on the tray, or with a gear crimper (PSM, Sept. '47, p. 170) If you use the pliers, hold them at a tangent. Squeeze and twist slightly to bend down the flare. If you prefer to make the mug instead of the cup, drop a 2 7/32″ disk into the larger end and solder in place.

After forming the handle as seen below, cut ½″ from the flattened end. Clamp to the mug and soft-solder the handle in place. The open lower end can be soldered over the bottom seam rivet to conceal it.

Initials may be scribed, cut with an electric vibrating tip, or etched with acid. For the latter, clean the metal well with strong soap, water, and steel wool. Then rinse and dry thoroughly. For a raised letter, simply paint it on with black asphaltum varnish. For a sunken letter, paint everything else with the varnish, leaving bare that part which is to be sunken. Immerse for 10 to 20 min. in a solution of 1 part nitric acid, 1 part sulphuric acid, and 1 part water. Wash well and remove the varnish with gasoline. It's best to try a scrap first.

An antique finish may be obtained by applying, with a saturated rag, a solution made by dissolving about 1 cu. in. of potassium sulphide in 1 pint of water and adding 6 drops of ammonia (PSM, Sept. '47, p. 171). Since the tray and mug are to be used for food, it is best to preserve the finish with lacquer rather than wax.

Bend the mug handle from ⅜″ copper tubing. First, scribe it ½″, 1″, and 4″ from one end. Flatten ½″ in a vise, bend to 180 deg. on a wood form 1 7/16″ in diameter, flatten to the 1″ mark, scribe at the angle indicated by a rule laid across the 1″ and 4″ marks, bend the flattened end to this angle, and cut off the other. Then solder the handle to the mug.

Copyrighted material

A Jacobean table from England, left, provided the inspiration for a modern version, right.

Old and New Tuckaway Tables Fold Flat

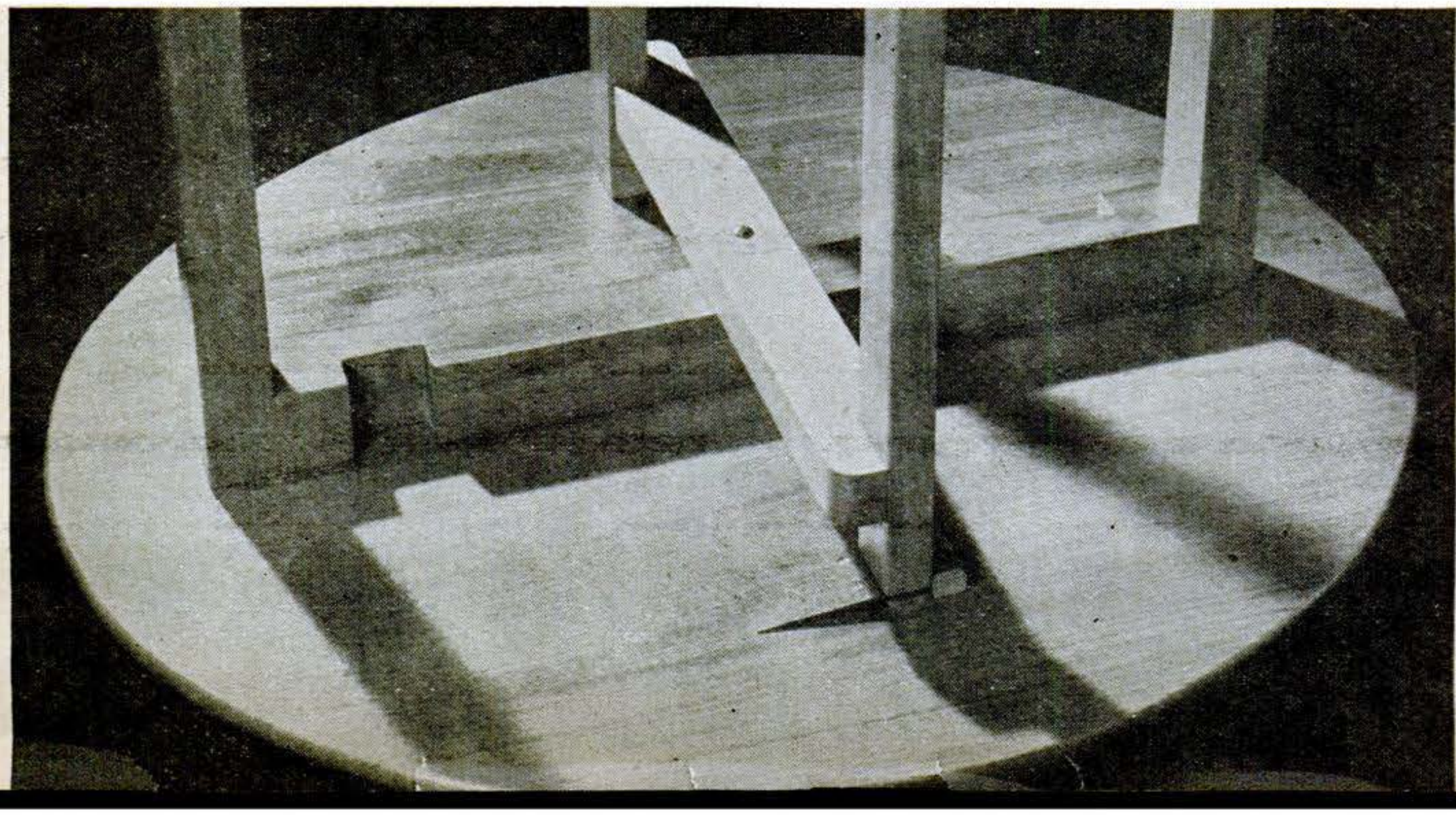
By Joseph Aronson

WHEN an antique English folding table of the type called a "tuckaway" recently came into my hands, the method of construction and operation seemed so simple and effective that I decided to make a modern version.

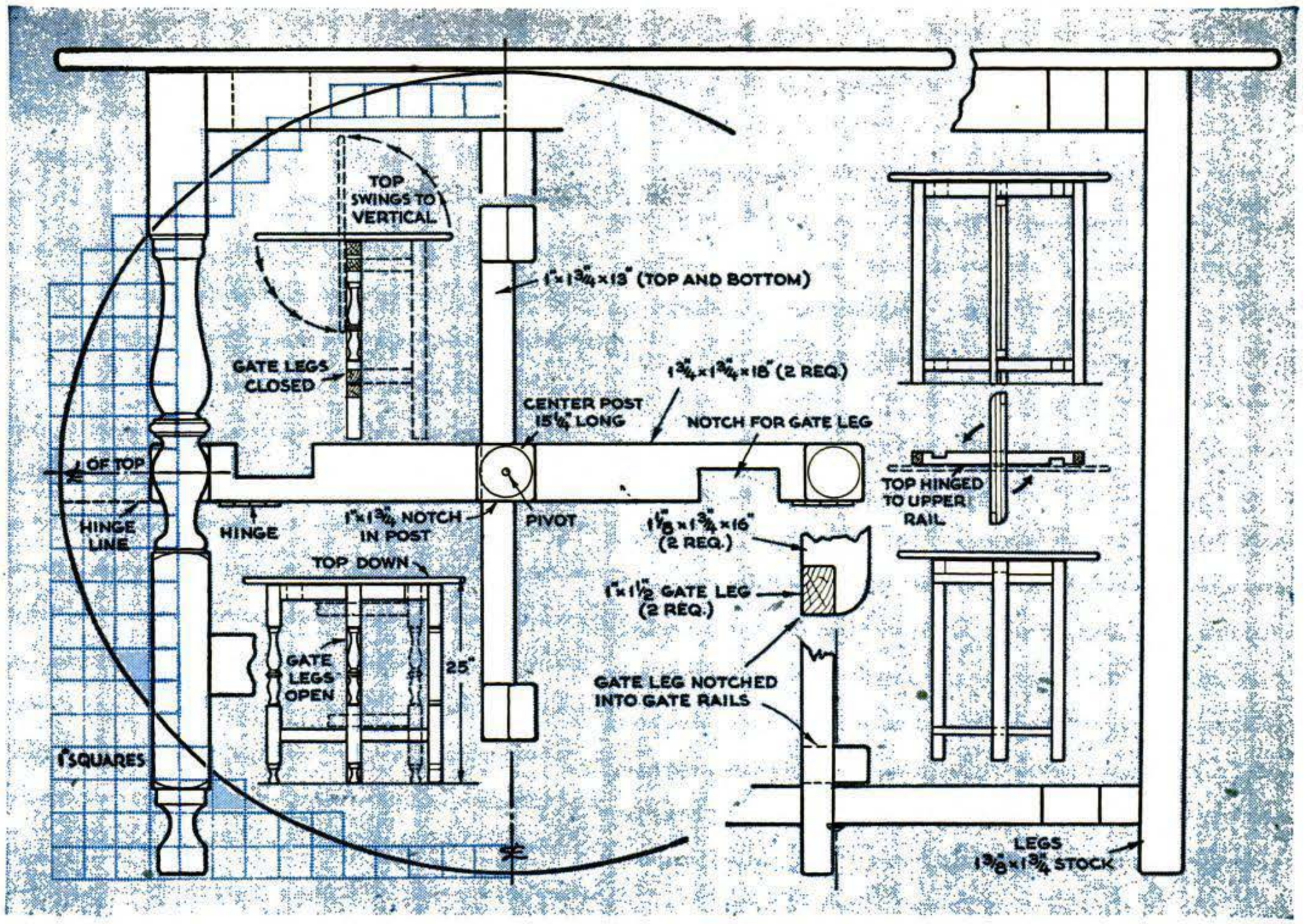
The original is styled in the Jacobean tradition. Such pieces may date anywhere from 1600 to 1800. Of heavy dark oak, the legs are identical turnings made into two

A notched wood wedge underneath the top locks one leg in place when the table is open.

This may be made in three parts, positioned, and then attached with glue and flathead screws.



Copyrighted material



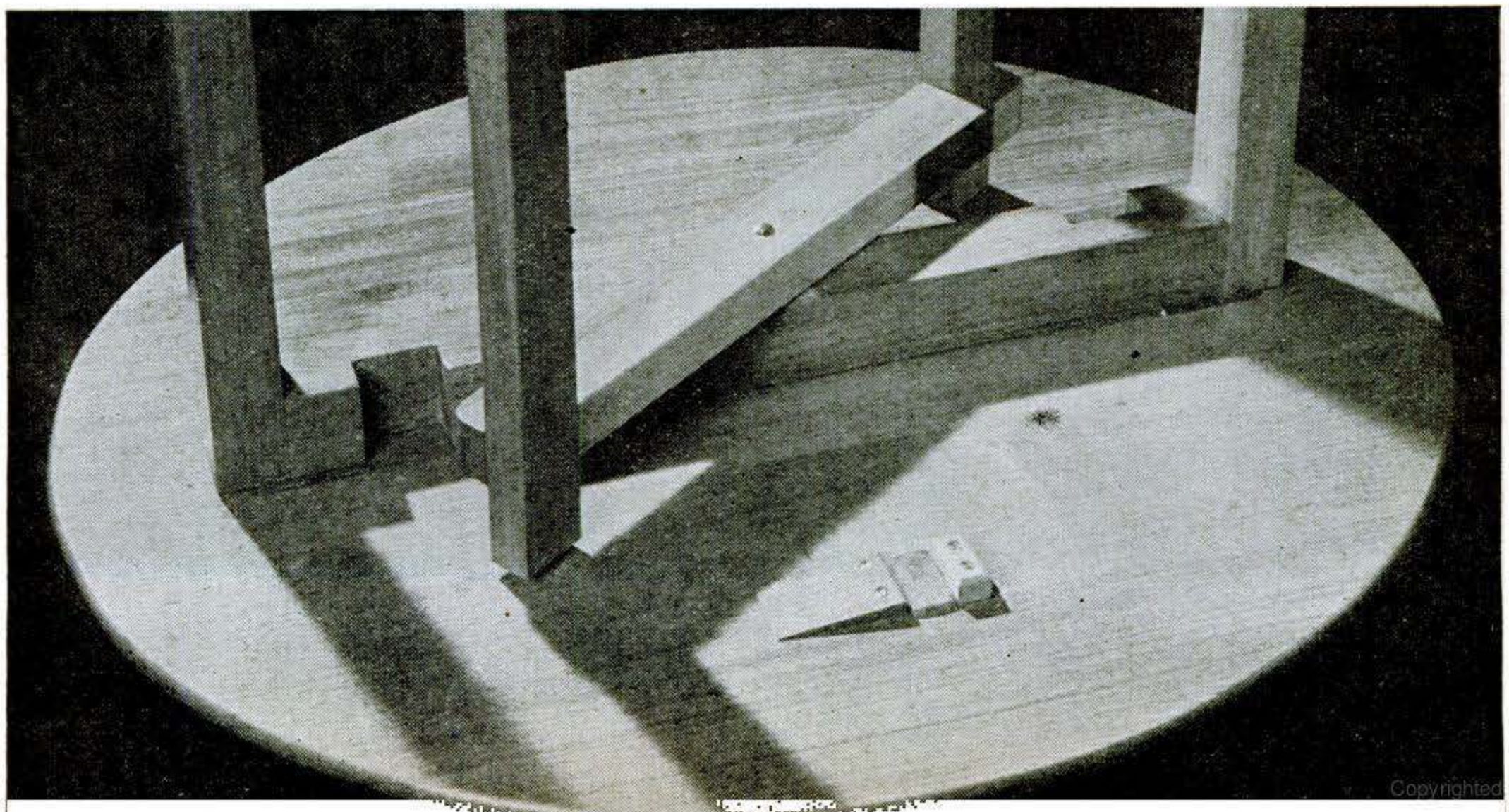
Either turned or rectangular legs may be used. With the latter, the center post is omitted.

gates by rectangular stretchers, notched into one another to fold compactly. A similar turning with the foot omitted is located at the center, a free-fitting dowel serving as a pivot. Since the top is hinged to one gate, the entire table will fold flat for storage. A notched wedge under the top holds the gate in position when the table is open.

To suit the new version to modern decoration, it was made of mahogany, and legs of rectangular section were used. However, legs could be turned just as well. The moving parts are pivoted on screws and washers, the center leg of the original design being omitted.

Gains were cut for the two small butt hinges so that the top rail would rest flush against the table top. The locking wedge, built up of three pieces, was located at 90 deg. to the other legs.

Pivoted by means of screws and washers, the legs swing into notches cut in the rails. Two hinges allow the top to be folded flat against the legs when the table is to be stored away.



Copyrighted material

Earring Tree Turned from Dural

STANDING on a dressing table, this earring holder looks like a tiny bejeweled Christmas tree, and her ladyship is sure to forgive you for locking yourself in the workshop for the few nights that it will require to complete. To see it in full color, turn to page 136.

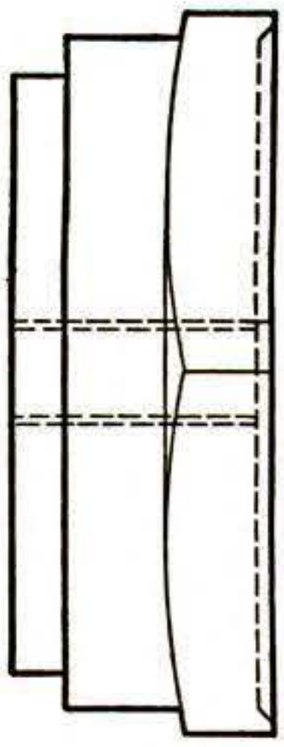
Starting with a length of ⅝″ dural bar, turn the column to the dimensions of the full-size drawing below. Grind the cutting tool with a decided back rake; use a fine feed and a high spindle speed. Polish to a high luster with fine abrasive paper and plenty of oil. While the work is still in the lathe, thread the shank ¼″-28.

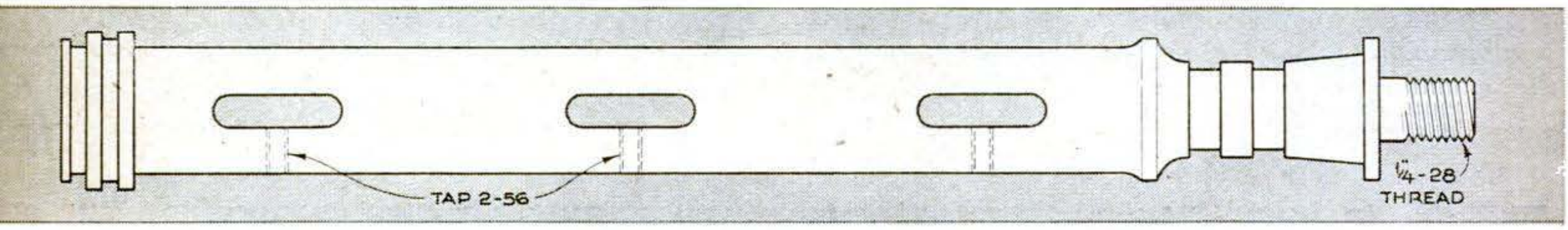
After protecting the polished surface with tape and clamping the column in a milling vise, mill three slots ⅛″ by ½″ at the points shown. If you have no milling attachment, perhaps you can clamp the column at center height on the tool slide. In a pinch, the slots could even be made by drilling a series of holes and filing away the waste between them, but this is slow work. Remove any burrs from the slots with light touches of a file.

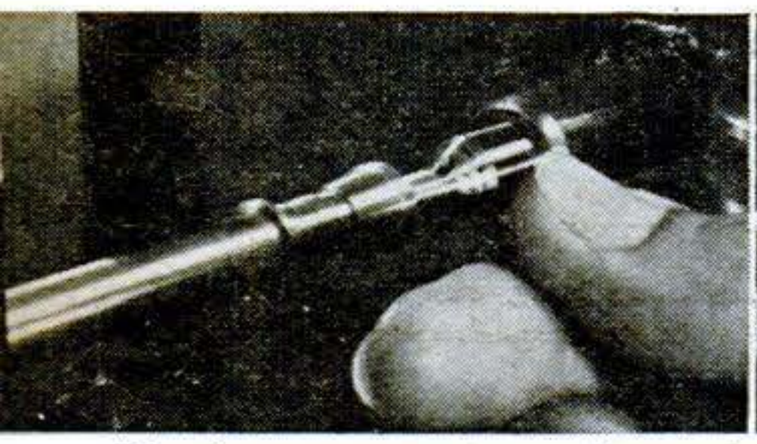
When the slots are milled, turn the work 90 deg. and drill three No. 50 holes, centering each in relation to the slots and tapping 2-56 for setscrews.

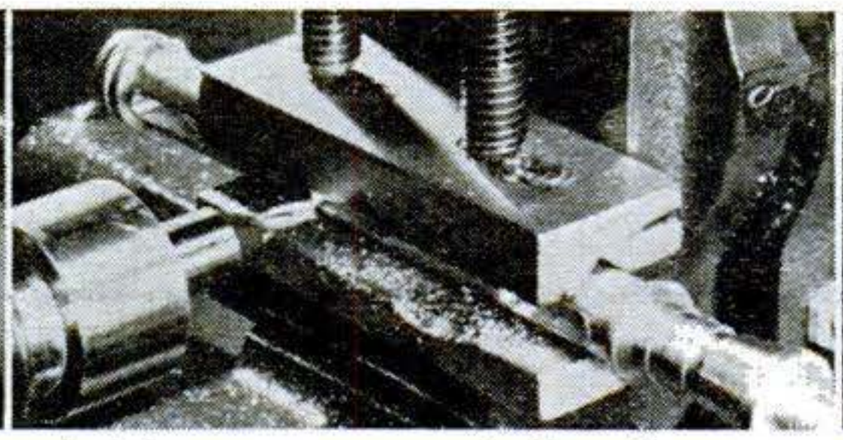
Out of 1¾″ hexagon dural bar, turn the base as in the full-scale drawing at the right of this page. After polishing the turned portions, reverse the work in the chuck and turn out a 1/32″ recess to take a felt disk. By using the index pin or back gears, lock the work in the required positions to dress the hexagonal faces with a file. Thread the base ¼″-28 to fit the column.

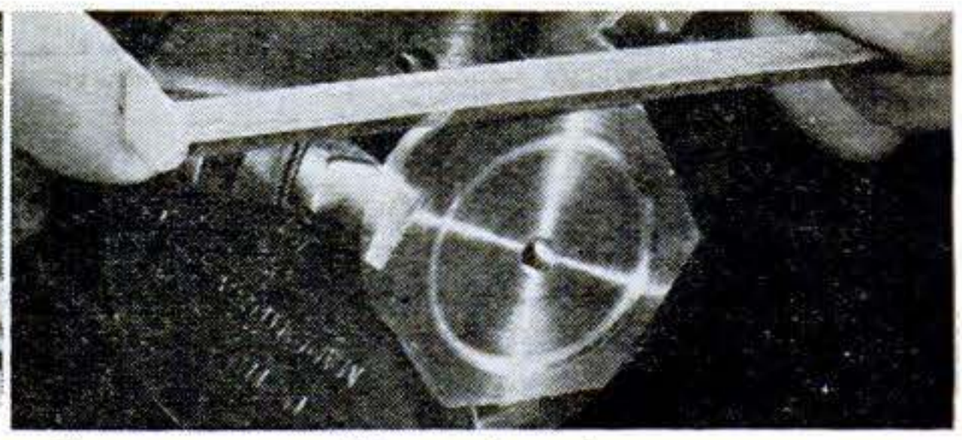
From ⅛″ clear plastic, cut three strips ½″ wide, one 4″ long, one 5″, and another 6″. Round the edges of each strip with a file, testing frequently to make a press fit in the slots. Wet-sand with fine abrasive, buff, and give a final polish on a soft cloth buffing wheel—without compound. Assemble by centering the plastic bars in the slots and tightening the setscrews. Complete the job by cementing a felt disk on the bottom.—BILL LUTHER.





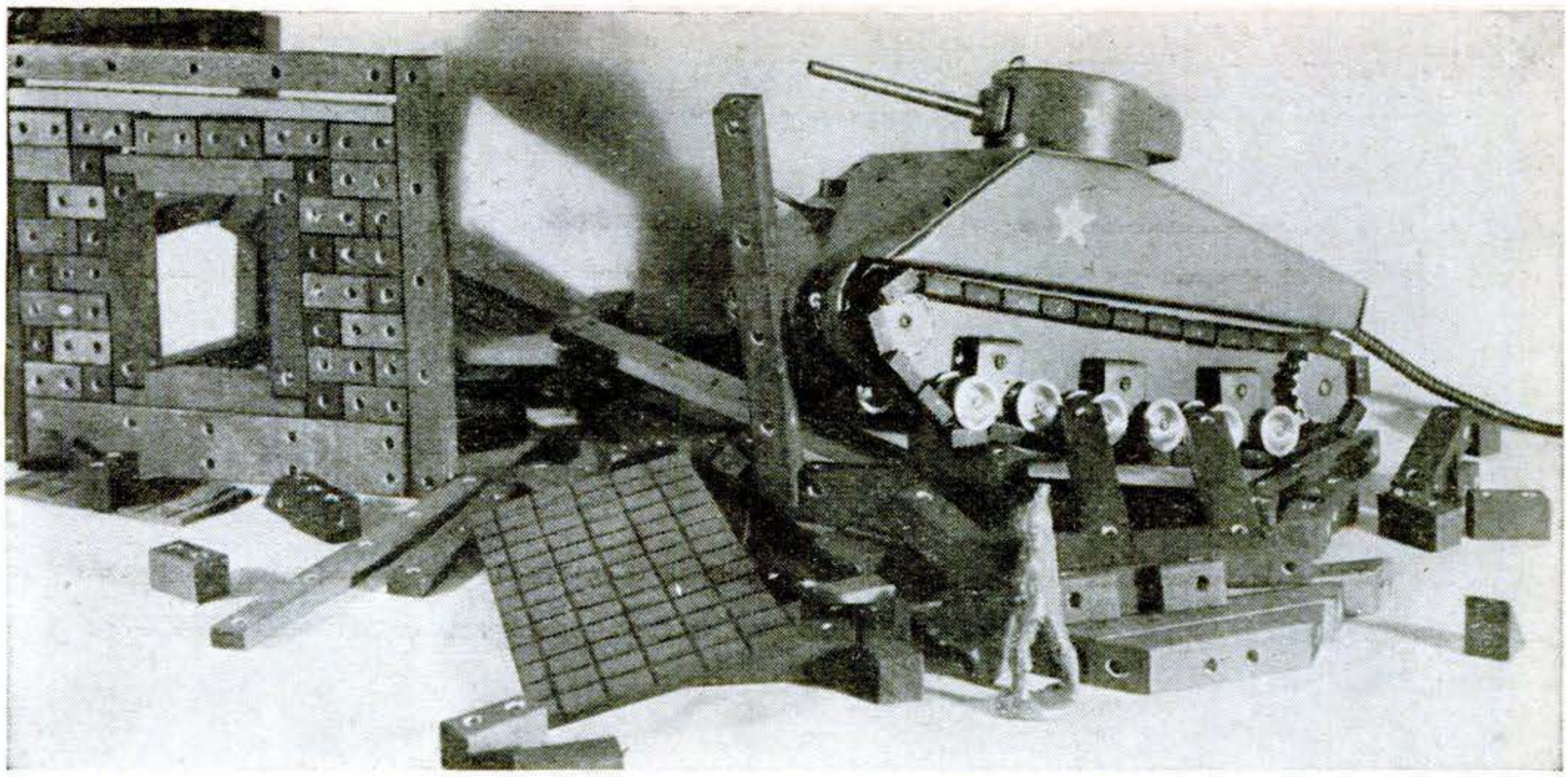






Various steps in making the holder are seen here. At the left, polishing the column after it has been turned; center, milling the slots; right, dressing the hexagonal base with file.

Copyrighted material



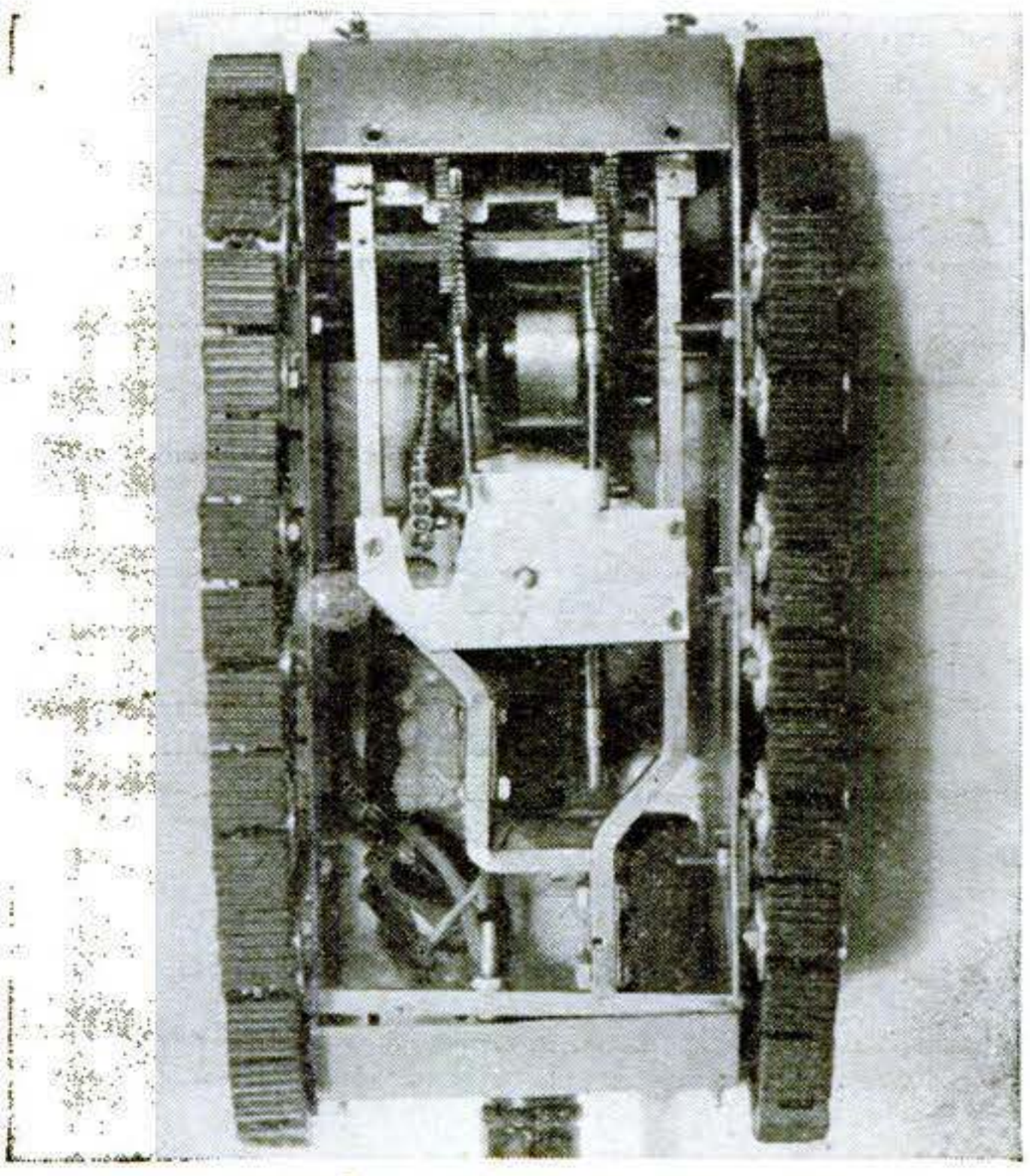
Electrically powered, the tank makes short work of toy forts in living-room war maneuvers.

Model Tank Packs a Wallop

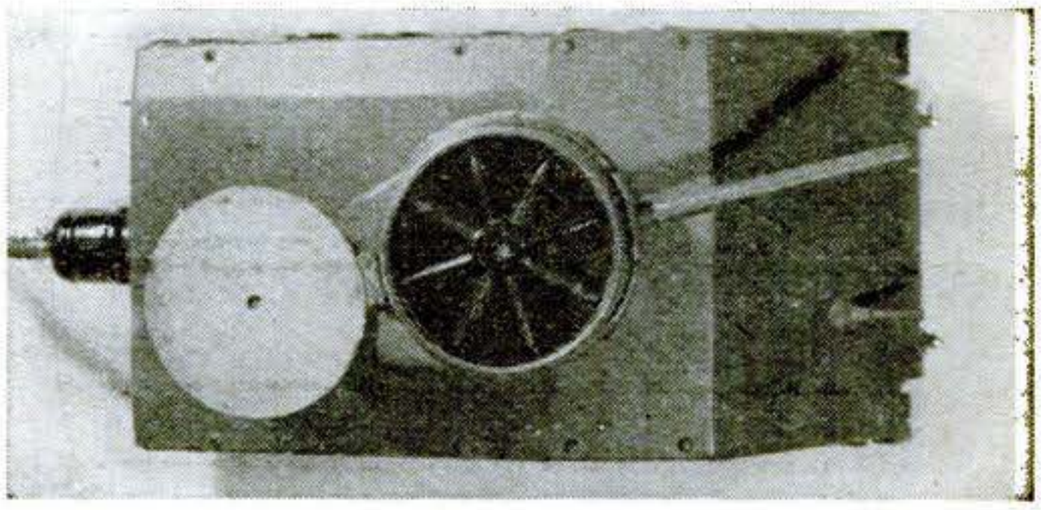
EQUIPPED with four electric motors, this control-line tank brings a remarkable note of realism to living-room war games in the home of Alfred J. Brosseau, of Cambridge, Mass., who spent a year and a half building it. Measuring 6″ by 12″, the model can imitate any action of its big brothers.

Two motors drive the tank, one being geared to each track. Another operates the turret, turning it through 360 degrees right or left. The fourth fires plastic shells from the turret by means of a train of gears, levers, springs, and a hammer.

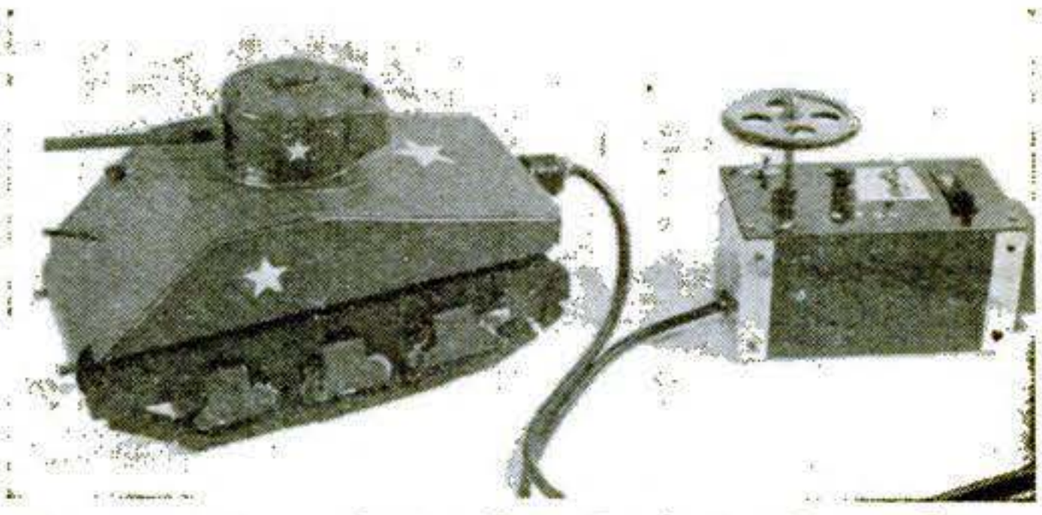
All operations are controlled by switches on the transformer box through a connecting cable to the tank, which can be made to slow down, speed up, turn, or fire at will.



Each track is driven by its own motor. These were taken from automobile defroster fans.

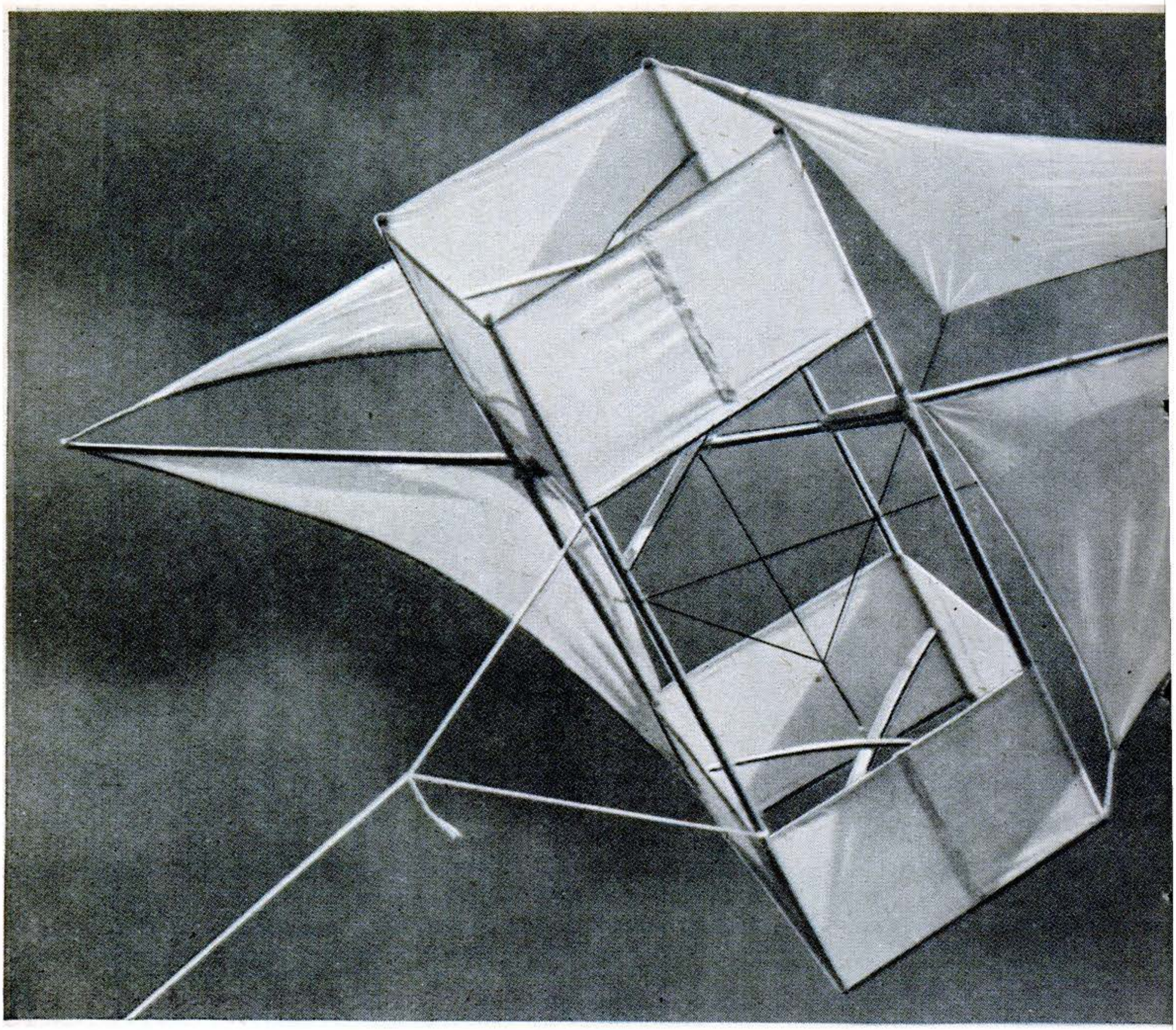


Plastic shells loaded in the top of the turret are shot mechanically with considerable force.



All controls are located in this box. The tank can be maneuvered anywhere within a 35′ circle.

Copyrighted material



Marconi-Rigged Kite Soars

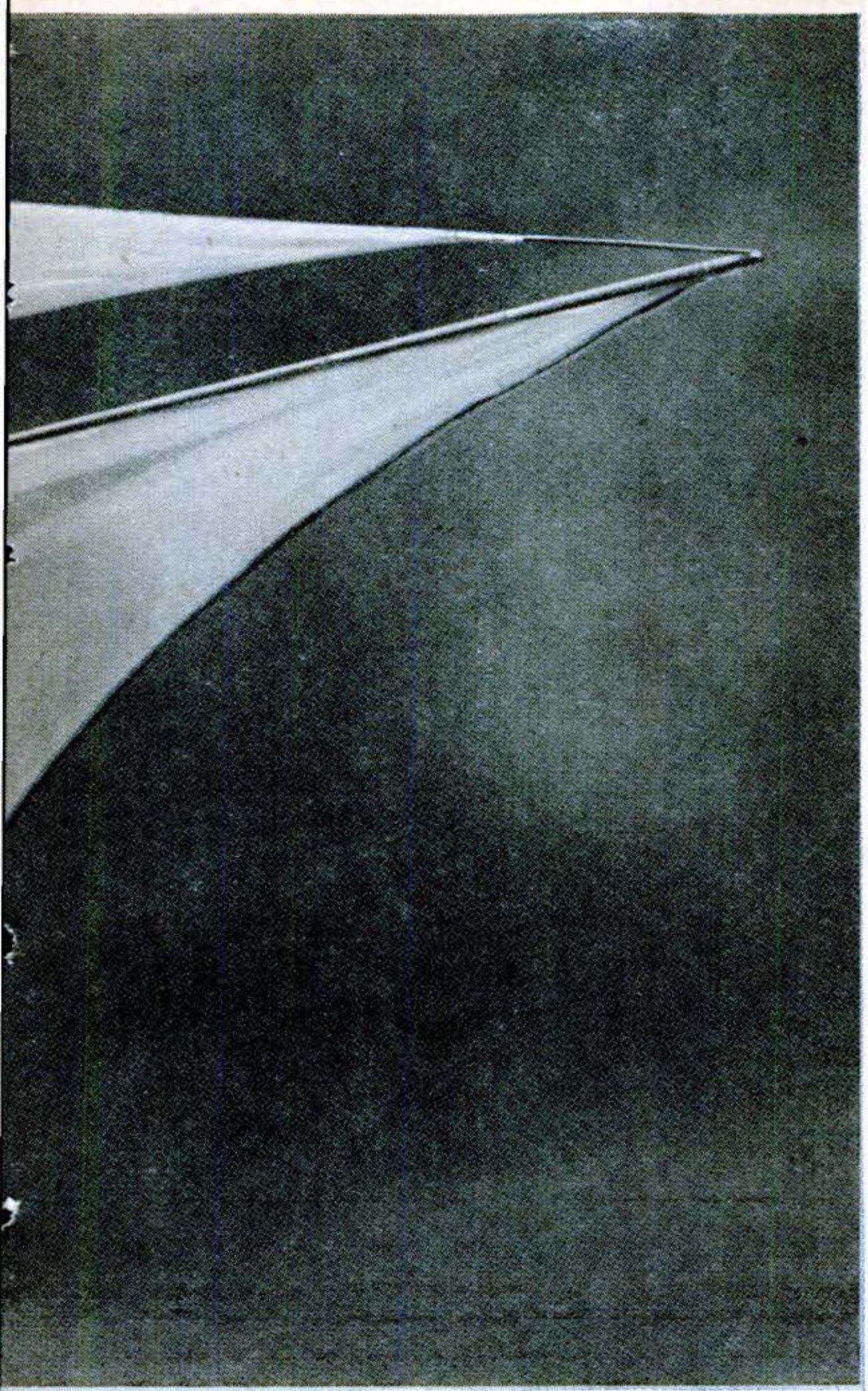
With hollow spars and stunsails for light airs, the Flying Cloud will outperform conventional box kites.

By W. Mack Angas

HERE'S a kite that will win all honors in a breeze—or in practically still air, for that matter. It is called the Flying Cloud and, like that famous clipper ship, it performs superbly when the wind is up. In a good blow it uses just its working sails, but it can also set auxiliary studding sails, or "stunsails," to sustain it in light air. With all sails set, the wingspread of the Flying Cloud is over 8′, yet the whole affair packs into a 42″ mailing tube for stowage and transportation.

As indicated in the drawings and photographs, Flying Cloud's basic element is a square box kite whose cells form the working sails. Hollowed spars make the unit exceptionally light, yet it's airworthy and sturdy enough to withstand good sailing winds. The studding sails, which may be compared to the jibs and mainsails of racing sloops, possess the high aerodynamic effici-

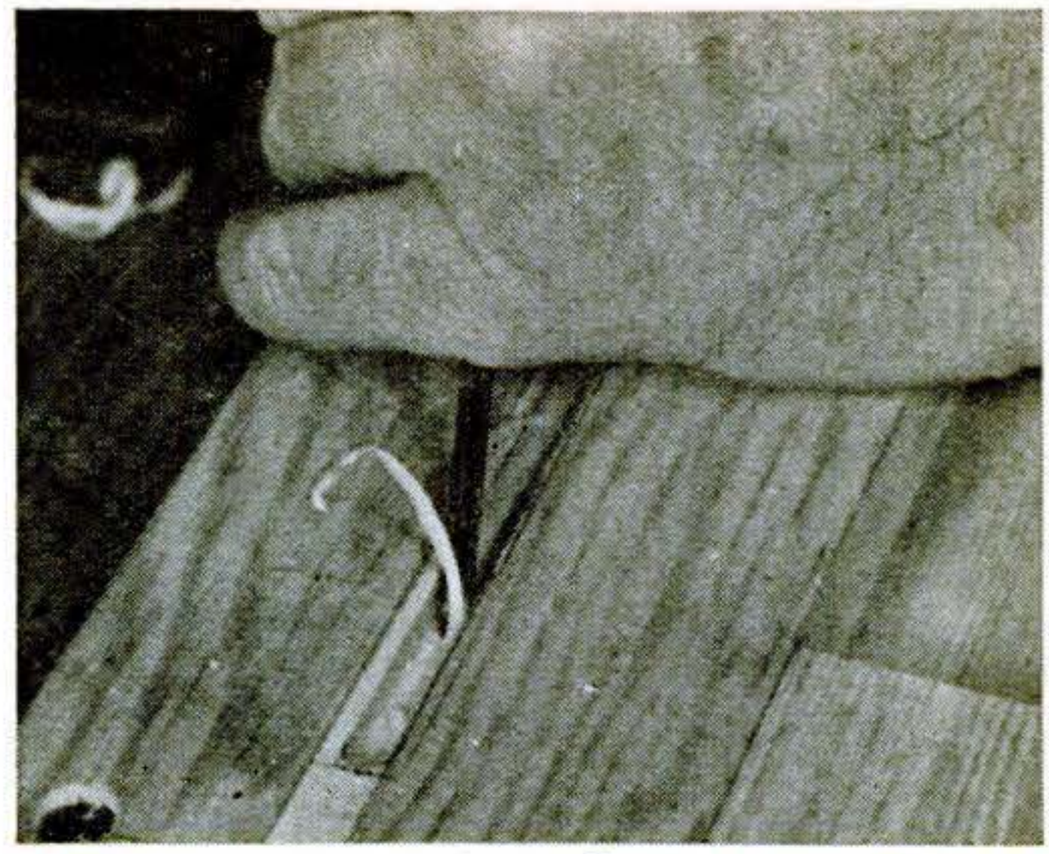
Copyrighted material



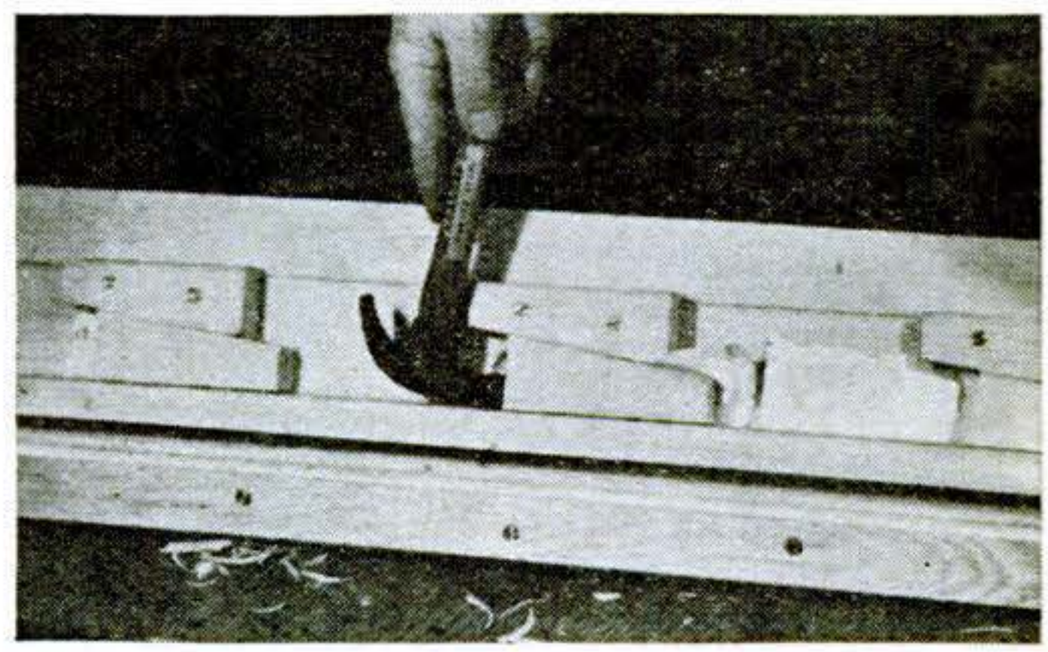
in a Breeze

ency of the Marconi rig. They will carry Flying Cloud aloft in a breeze so light that even flimsy paper-covered kites will barely hold the air.

Each of the four spars of the box kite and the two stunsail spars is made of a pair of hollowed ¼" by ½" spruce sticks glued together. After the glue has set, the spars are planed into octagonal—and finally circular—shape, except for the flat spots where the spreaders, stunsail spar carrier, and spar-carrier's mate seat against them. These points are indicated by the varying sections shown in the spar details. After planing,

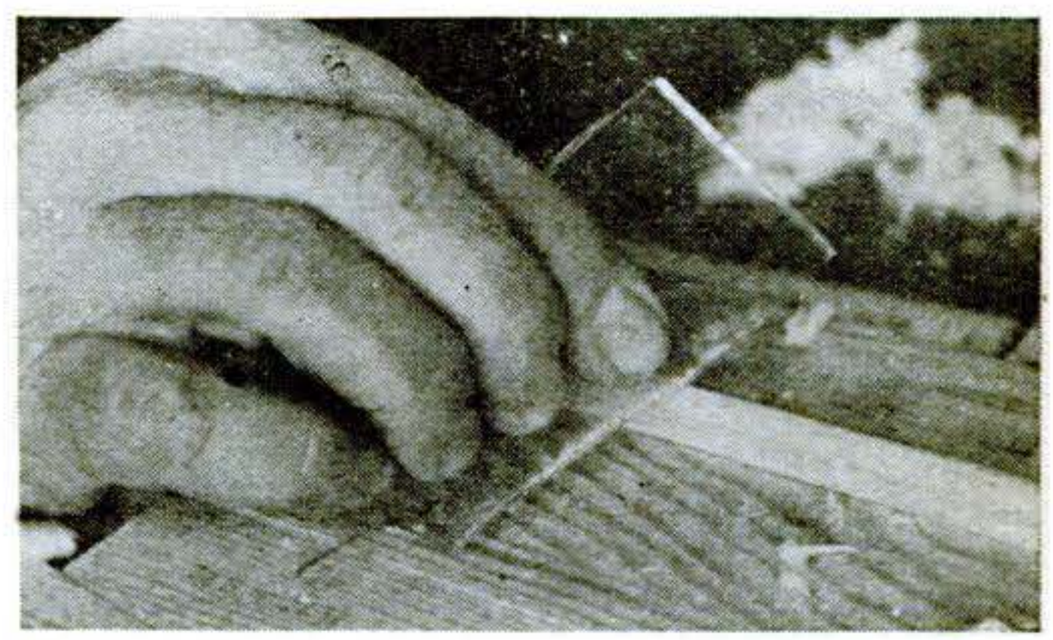


Each spar is made by hollowing two ¼" by ½" sticks. A wooden jig makes hollowing easier.



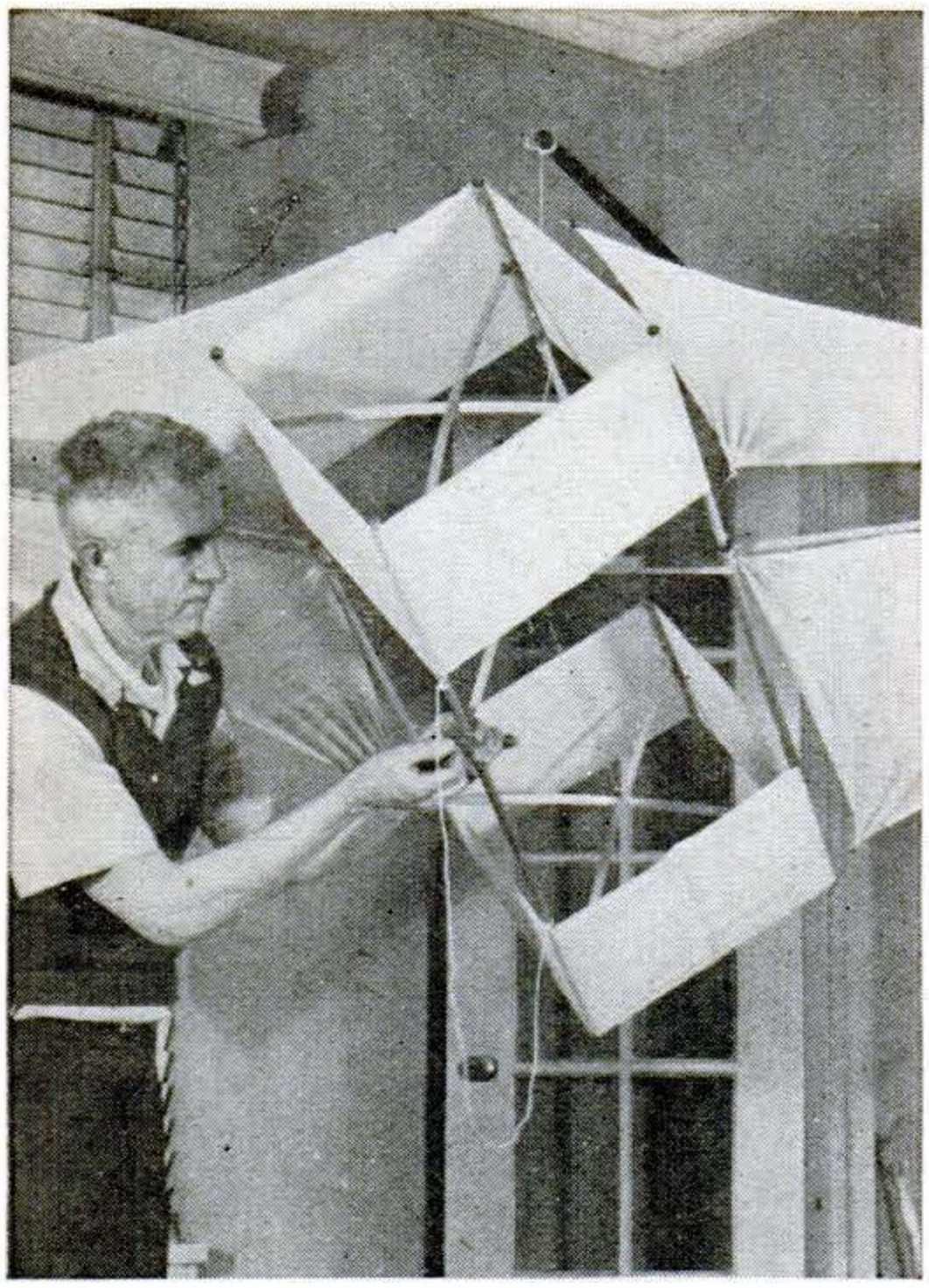
Glue the two parts together, using waterproof glue and a wedge clamp made as shown above.

Round the spar corners with a plane, leaving flats where indicated so as to seat the crosspieces.



Scrape the spars as smooth as possible. They are finally sanded and coated with spar varnish.

Copyrighted material



Assemble the kite and wings. For easiest disassembly, use wire hooks to attach all cords.

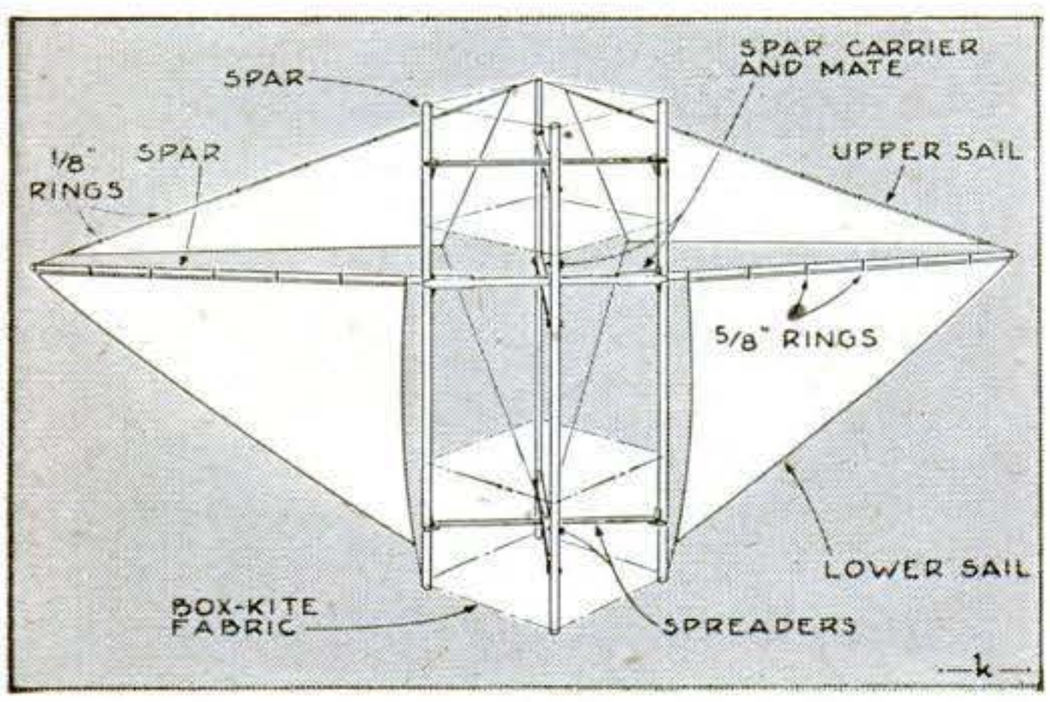
Stowing the kite. The entire affair, sails and all, fits into a 42″ mailing tube for storage.

spars should be scraped and sanded. Wedge-shaped stops are glued to the spars to hold the socketed spreaders, carrier, and mate. These parts are made of spruce and plywood. Allow about ¼″ extra length on the spreaders, then trim the jaws just enough so that the spreaders will be slightly bowed when snapped into place.

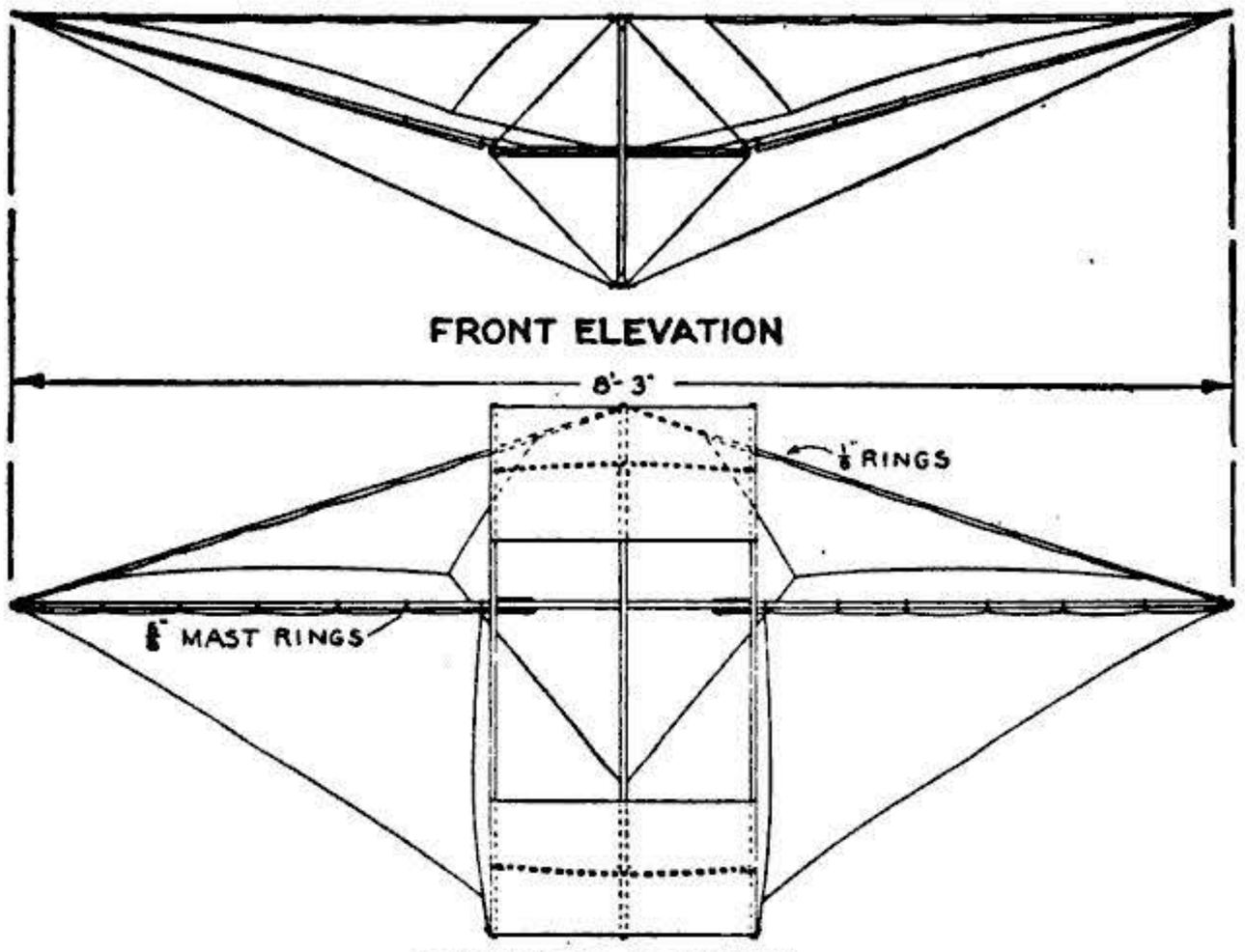
Sand all wood and coat it with spar varnish to prevent the absorption of moisture should the kite enter a cloud. Either a strong light paper or a closely woven light cambric may be used for the covering and sails. Cloth, of course, is necessary if the kite is to be flown in damp weather or into low clouds. If cloth is used, the warp, or lengthwise threads, of the fabric should be at right angles to the long edges of the sails. The cutting plan given for 42″ fabric shows how this requirement may be met. For other widths of material a different pattern is needed, but the same relationship of thread direction should be observed. Note that each of the working sails is cut in two sections; the arrows that cross from one piece into another indicate where the ends of the cloth must be stitched in order to obtain the necessary length.

For the stays and rigging of the kite, use a good quality of fishline or the type of linen line sold by hobby shops for rigging model yachts. All lines are secured to the frame by means of small hooks made from wire hairpins. These hooks connect with cord loops; do not use wire loops as the hooks may disengage them if the kite towers and slackens or shakes momentarily.

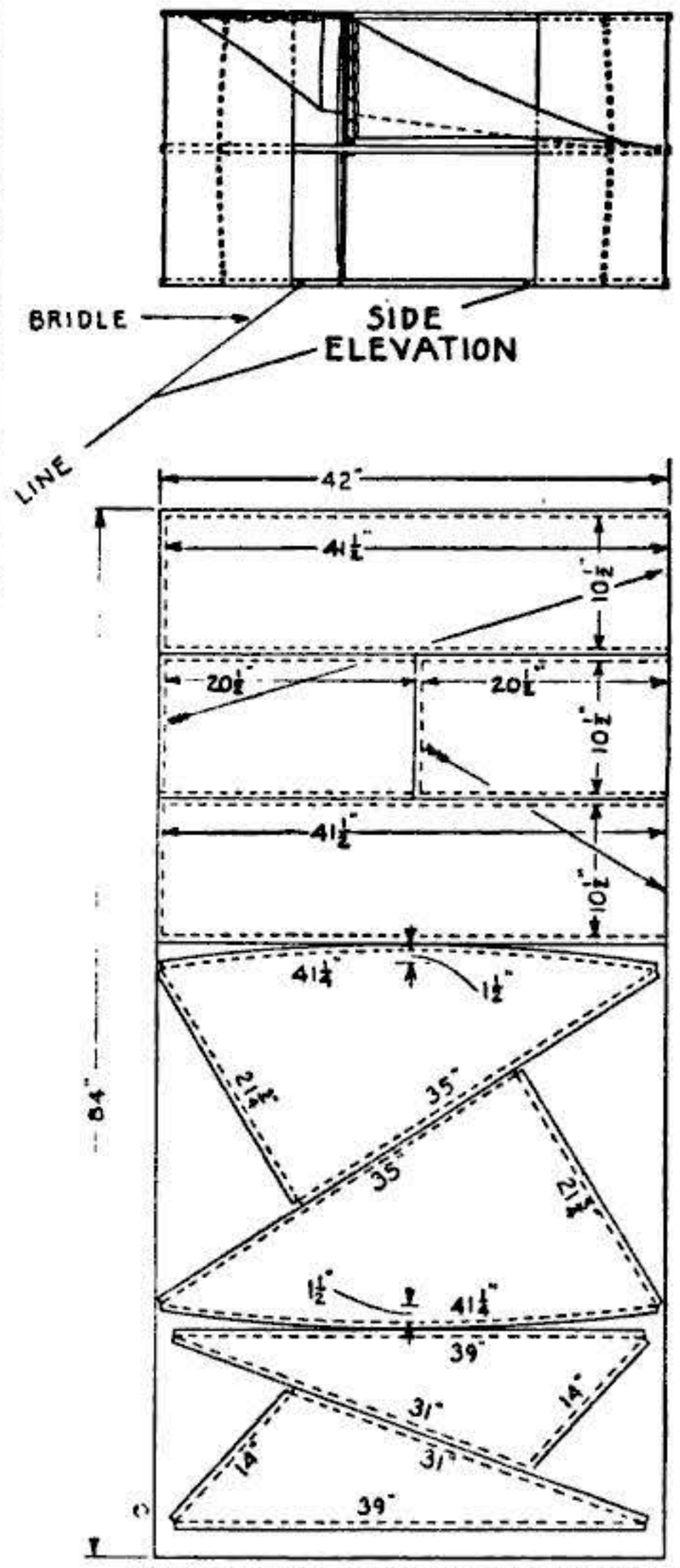
Fly the kite with the lightest twine of 30-lb. breaking strength that you can get. The arrangement of the bridle shown in the drawing is for light breezes; in strong winds shift the point of attachment of the line further back on the bridle. Do not use the stunsails in a breeze that is heavy enough to carry the box kite alone. **END**

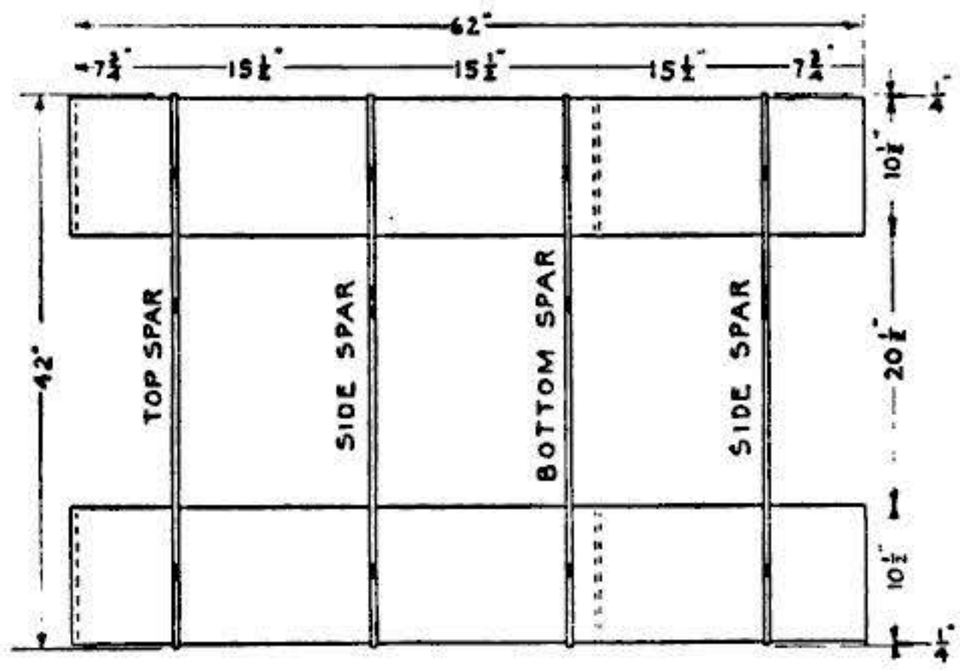


Copyrighted material



VIEW FROM BELOW

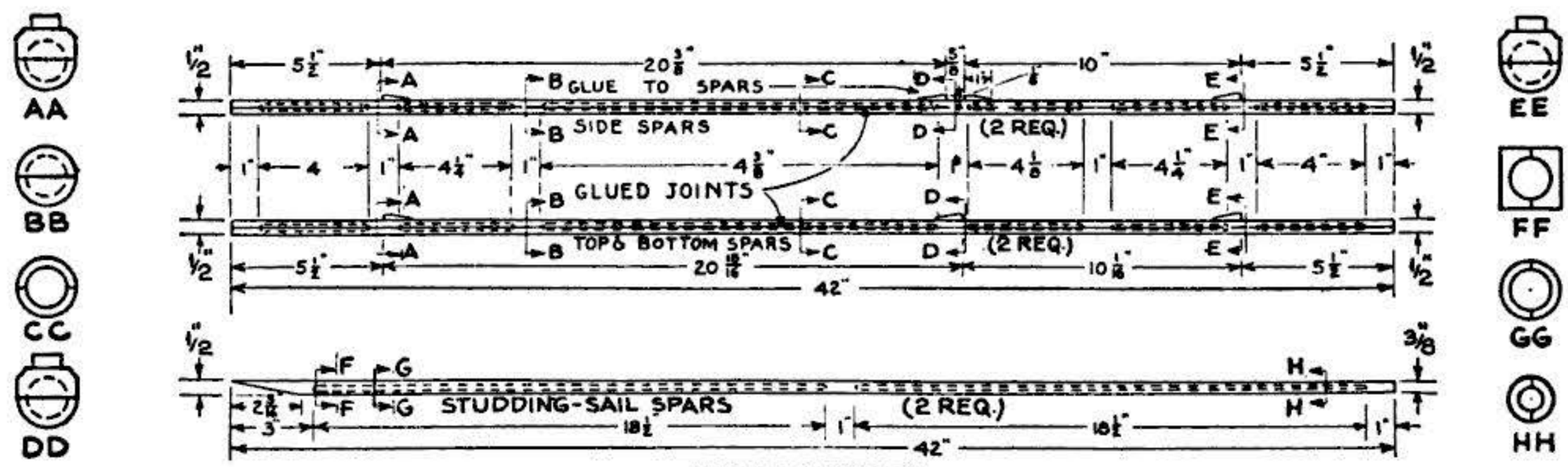




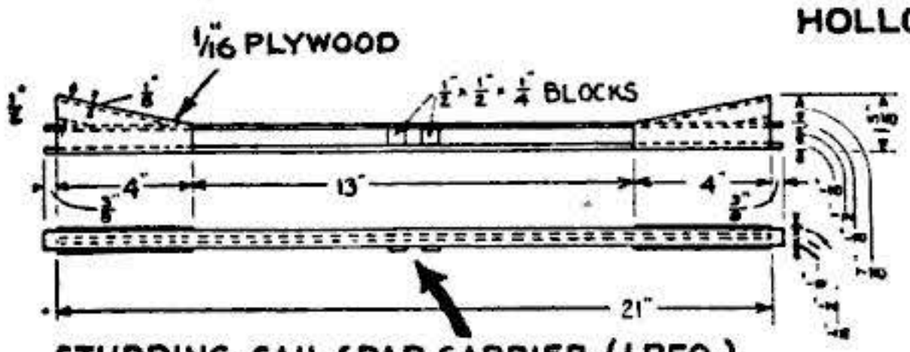
SPARS AND FABRIC BEFORE CLOSING FINAL SEAMS

DIMENSIONS ARE TO FINISHED LINES, SHOWN THUS — — — — — — — —
CUTTING LINES SHOWN THUS ———
1/2" ALLOWANCE FOR HEMS AND SEAMS

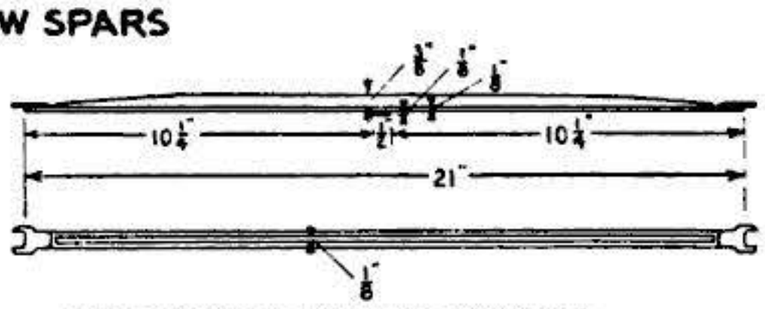
CUTTING PLAN FOR 42" MATERIAL



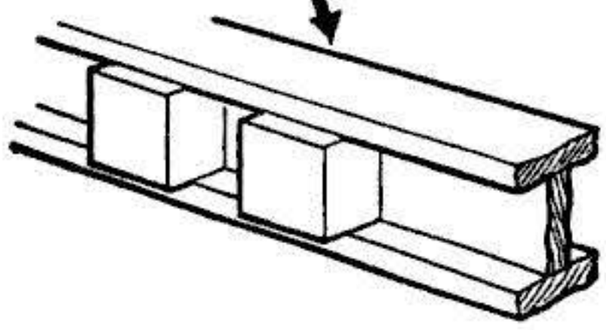
HOLLOW SPARS

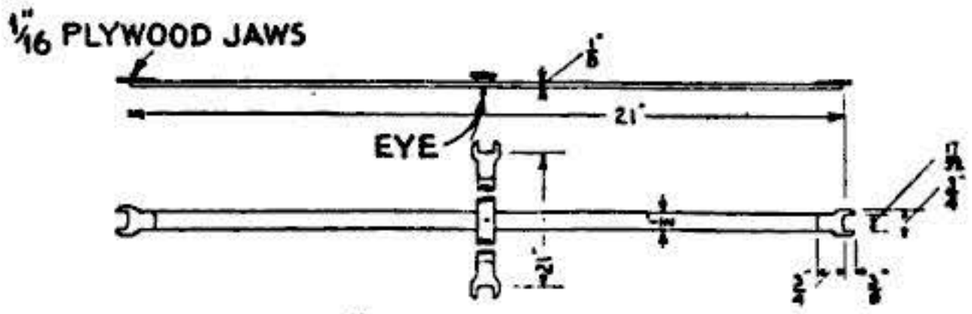


STUDDING-SAIL SPAR CARRIER (1 REQ.)



SPAR-CARRIER'S MATE (1 REQ.)

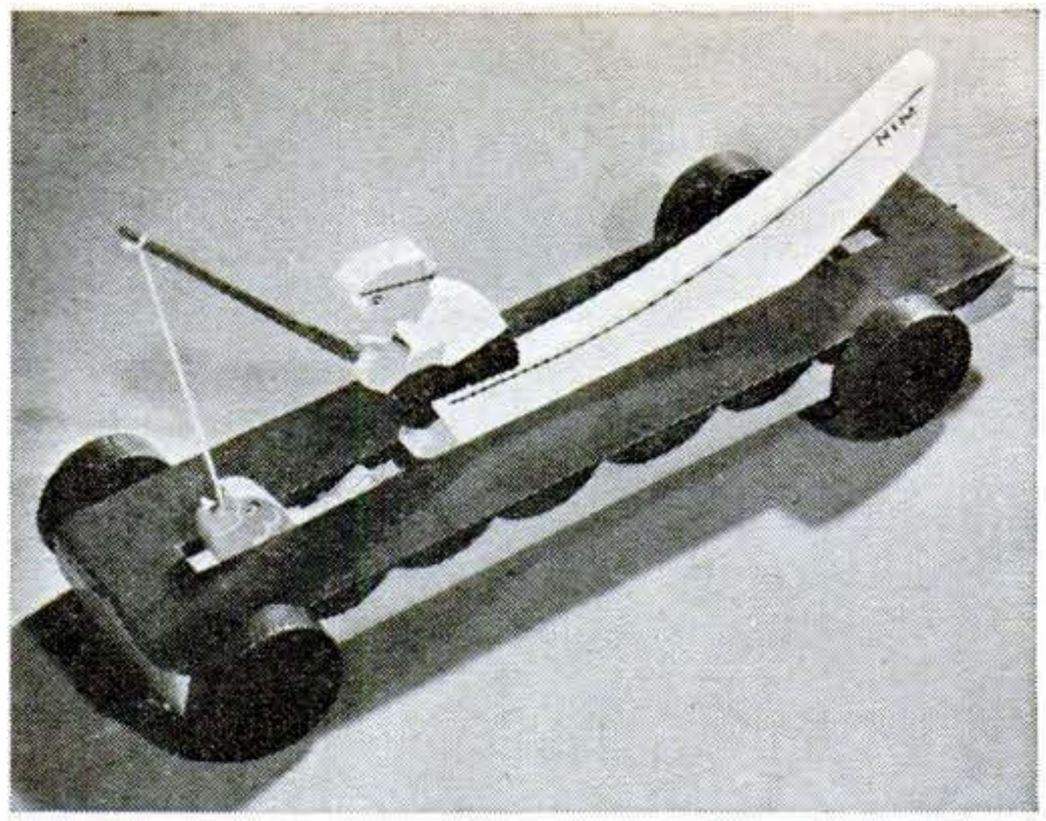




SPREADERS (MAKE 2 SETS ~ 4 STICKS REQ.)

Copyrighted material

Fisherman and Boat Ride Waves on Pull Toy



LOTS of action in a pull toy makes a hit with the kids. Here's one that more than fills the bill, for the little white boat rocks and the fisherman pulls the fish out of the water as the toy is pulled along.

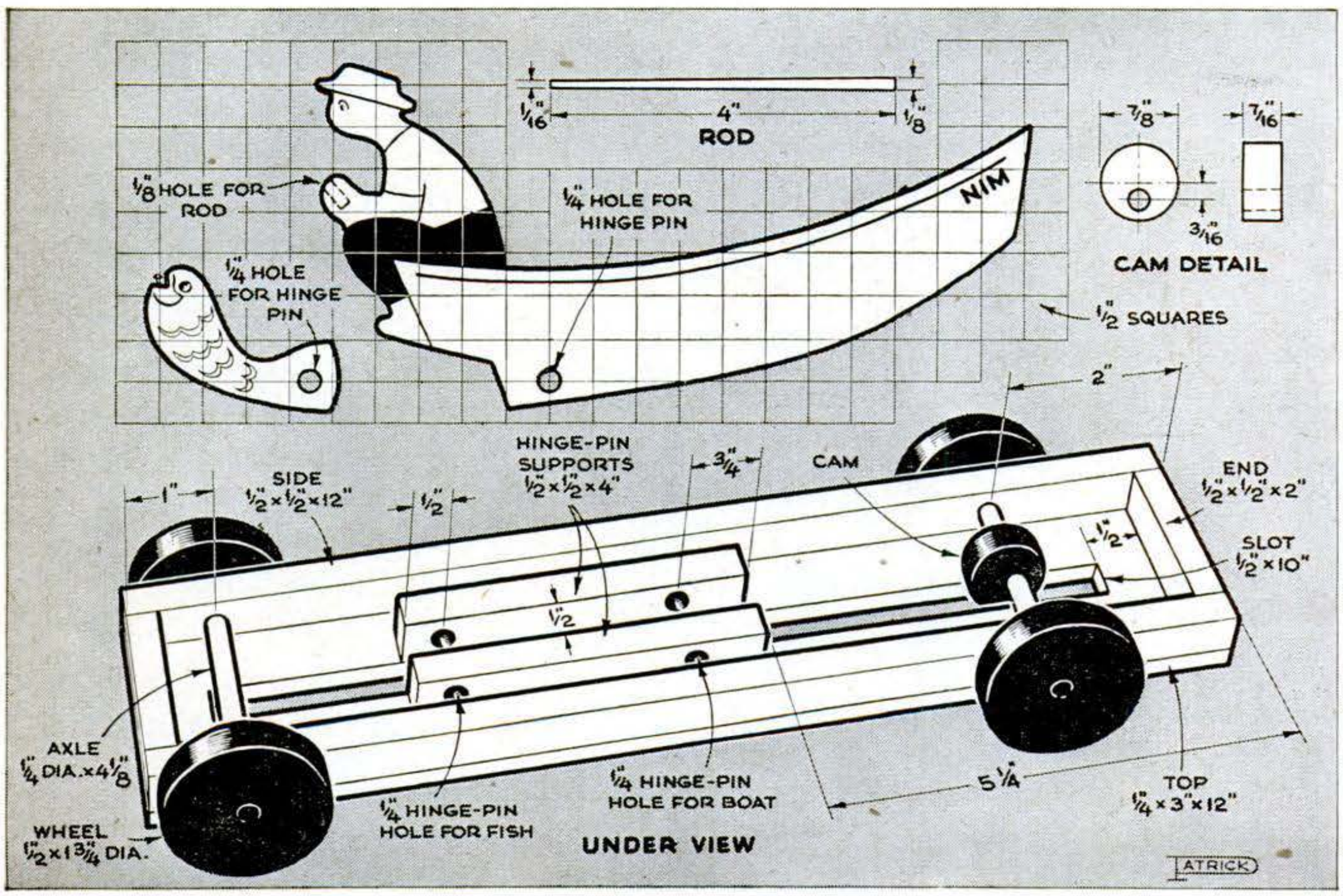
Cut the top of the base from ¼″ plywood, drilling a hole and starting the slot with a coping saw and finishing with a keyhole saw. The sides, front, back, and two hinge-pin supports are made of ½″ pine. Match the sides carefully, clamp them together, and drill holes through both simultaneously to provide a free fit for the ¼″ dowel axles. Drill holes in the two supports in the same manner for the boat and fish hinge pins, the latter also cut from ¼″ dowel.

The wheels may either be turned on a lathe or cut from round stock. Drill the axle holes so that the axles are a press fit. The cam that rocks the boat is a ⅞″ wheel with the hole drilled 3/16″ off center.

Saw the fish and the boat and figure from ½″ pine, drilling the ¼″ hinge-pin holes first to prevent splitting. Also drill a ⅛″ hole in the hand of the figure to receive the pole, a 4″ dowel tapered from ⅛″ at one end to 1/16″ at the other. A thin length of bamboo or other flexible material might be used instead for even more realistic action.

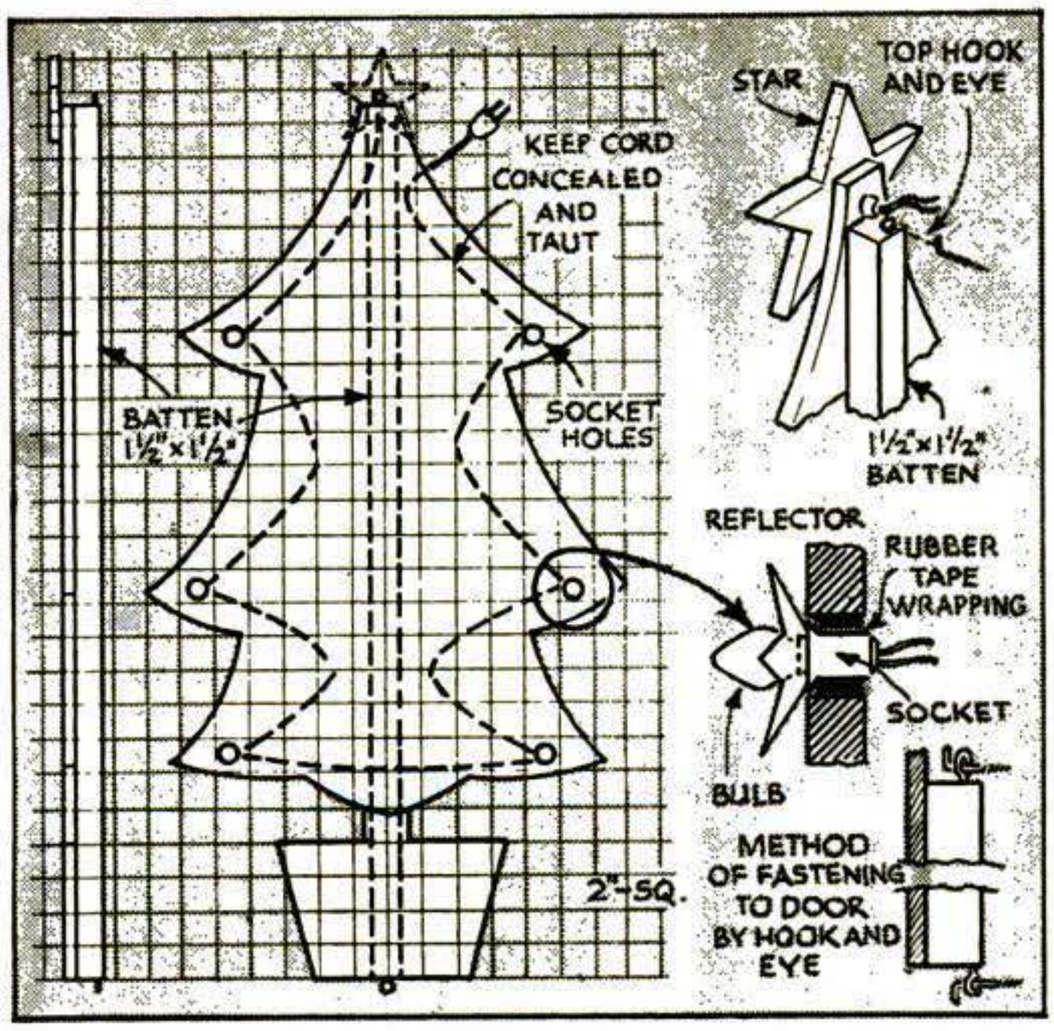
Shellac all the parts and then apply two coats of enamel. As seen in the color photo on page 136, the wheels are black, the base is two shades of blue-green, the fish red with yellow scales, and the boat white. The man wears a white shirt, black pants, and a yellow hat. Varnish or stain the fishing pole. Outline shirt, hat, and eye in black.

In assembling the parts, make certain the hinge pins and axles turn freely. Run a line from the pole to the mouth of the fish so it will move with the boat. Turn a screw eye in for the pull string.—JAMES J. O'HARA.



Copyrighted material

Lighted Tree Decorates Door for Yule Season



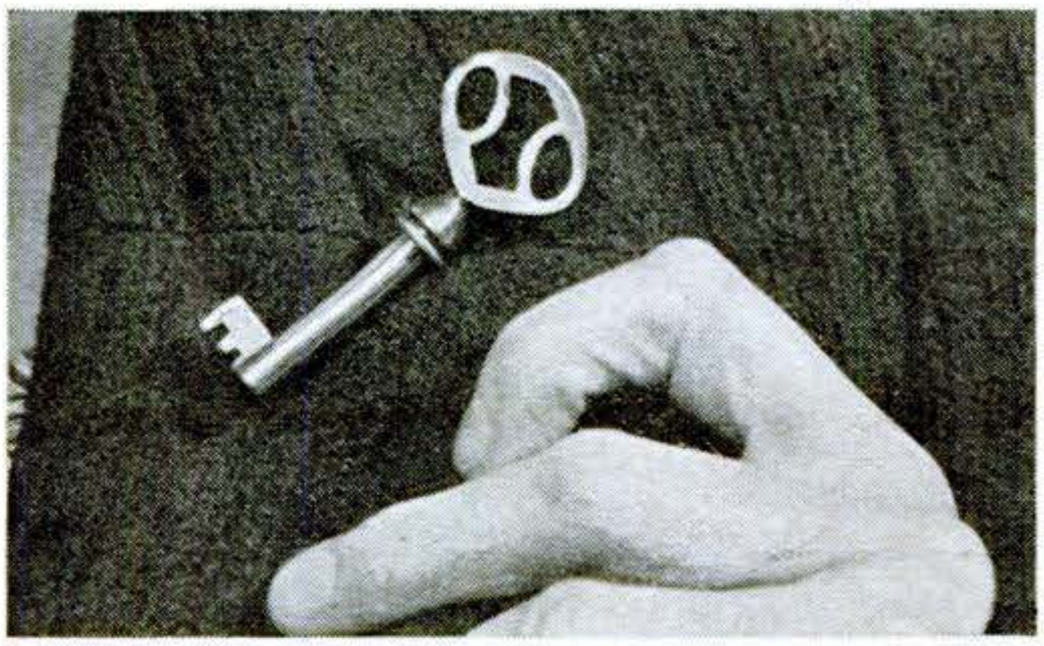
ILLUMINATED by a set of standard outdoor Christmas lights, this painted ornament will provide a cheerful decoration for your door during the holiday season. Its size may be varied to suit the door.

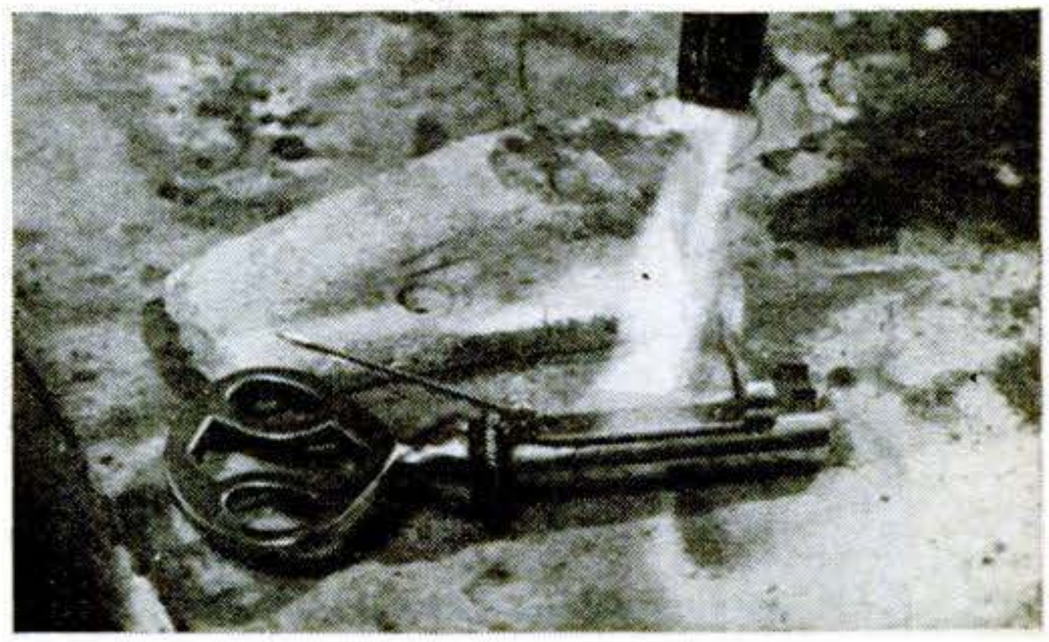
Lay out and saw the tree and pot from outdoor plywood, composition board, or similar material. Cut the big star separately from a scrap of the same material and nail or glue it in place. Reinforce the tree cutout with an upright wood batten on the back.

Drill holes equal to the outer diameter of the socket lips and set the sockets flush with the outer face of the panel, wrapping friction tape around the body of each for a press fit. Wiring is concealed as indicated by the dotted lines in the drawing. The feeder line must not interfere with operation of the door. In this case, it was connected to the porch-light socket, the cord being looped to provide slack for the door to open and close.

Reflectors in star form may be cut from tin-can stock. Paint the tree as desired, and glue on decorative strips cut from wallpaper borders.—MICHELE DE SANTIS.

Polished Brass Key Serves as Lapel Ornament





OLD brass keys may be turned into attractive lapel ornaments or brooches. Such keys often are available for a few cents in secondhand stores.

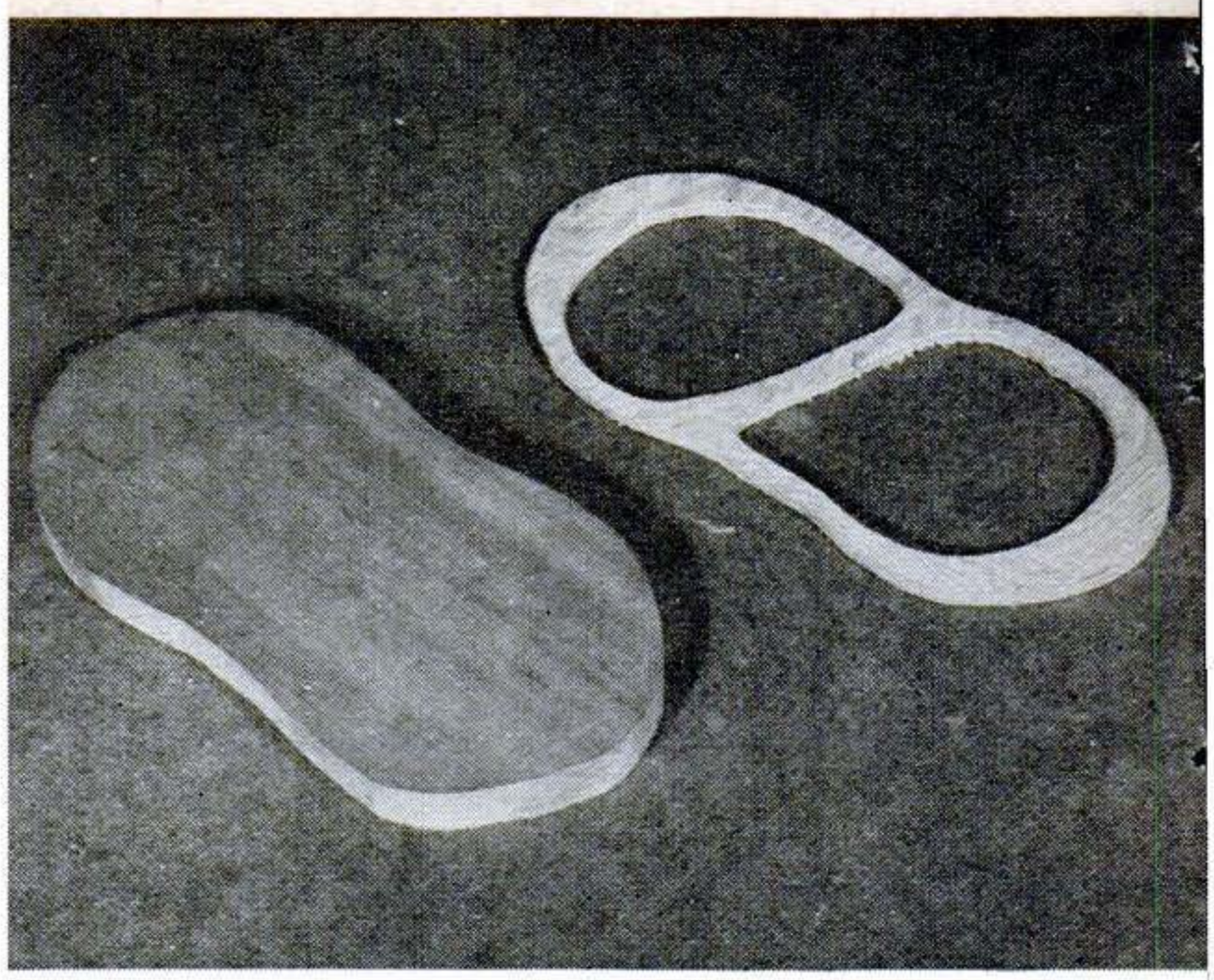
First, clean up and polish the brass. One way of doing this is to use a cloth buffing wheel charged with rouge. Then, to the less attractive side (if there is a choice), solder a standard brooch pin, preferably one equipped with a safety catch. You can use soft solder, silver solder, or a brazing alloy that matches the metal. Finally, apply a coat of clear lacquer to the key to retard tarnishing.—WALTER E. BURTON.

Copyrighted material

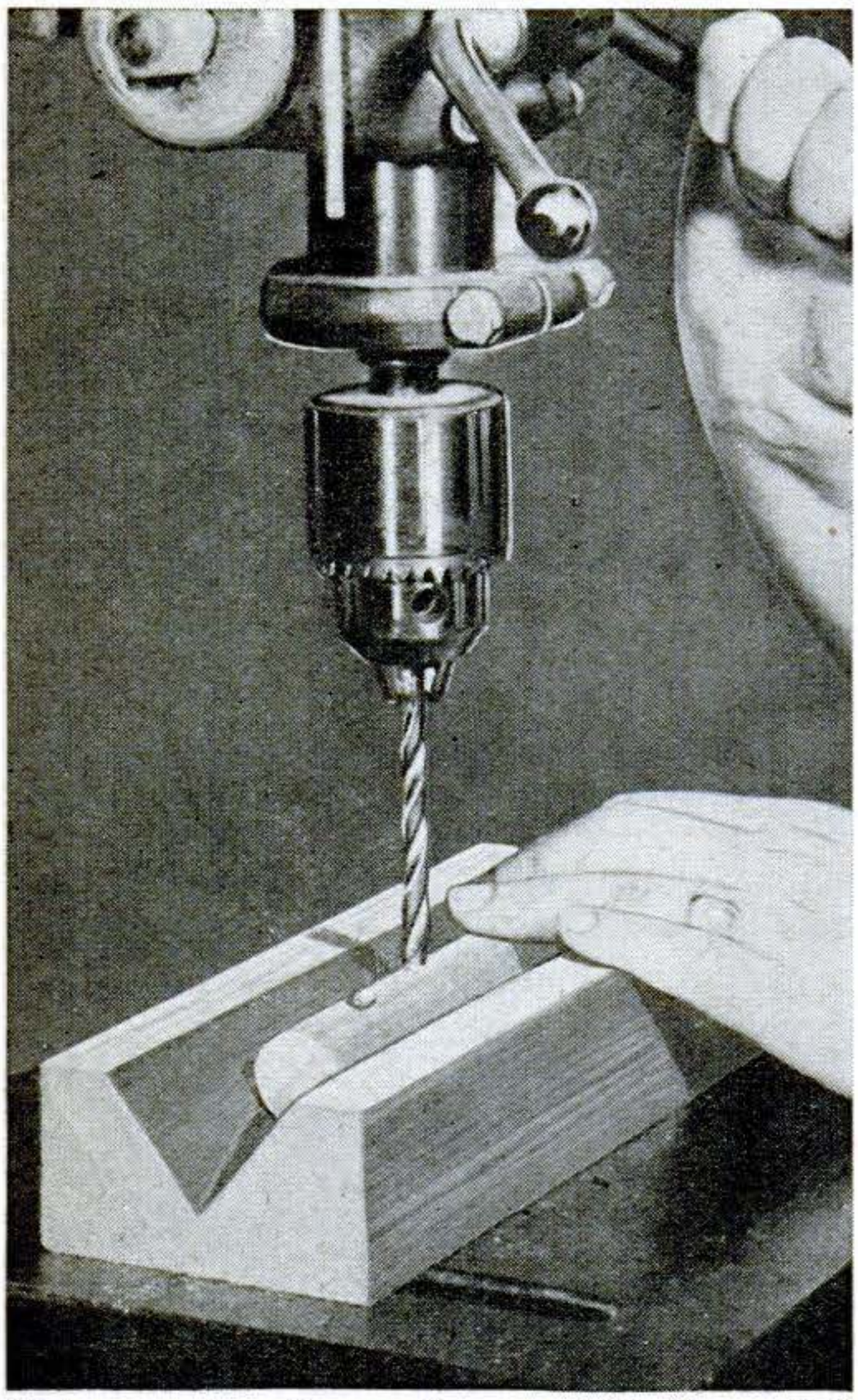
Let Your Drill Press Do It

By Elma Waltner

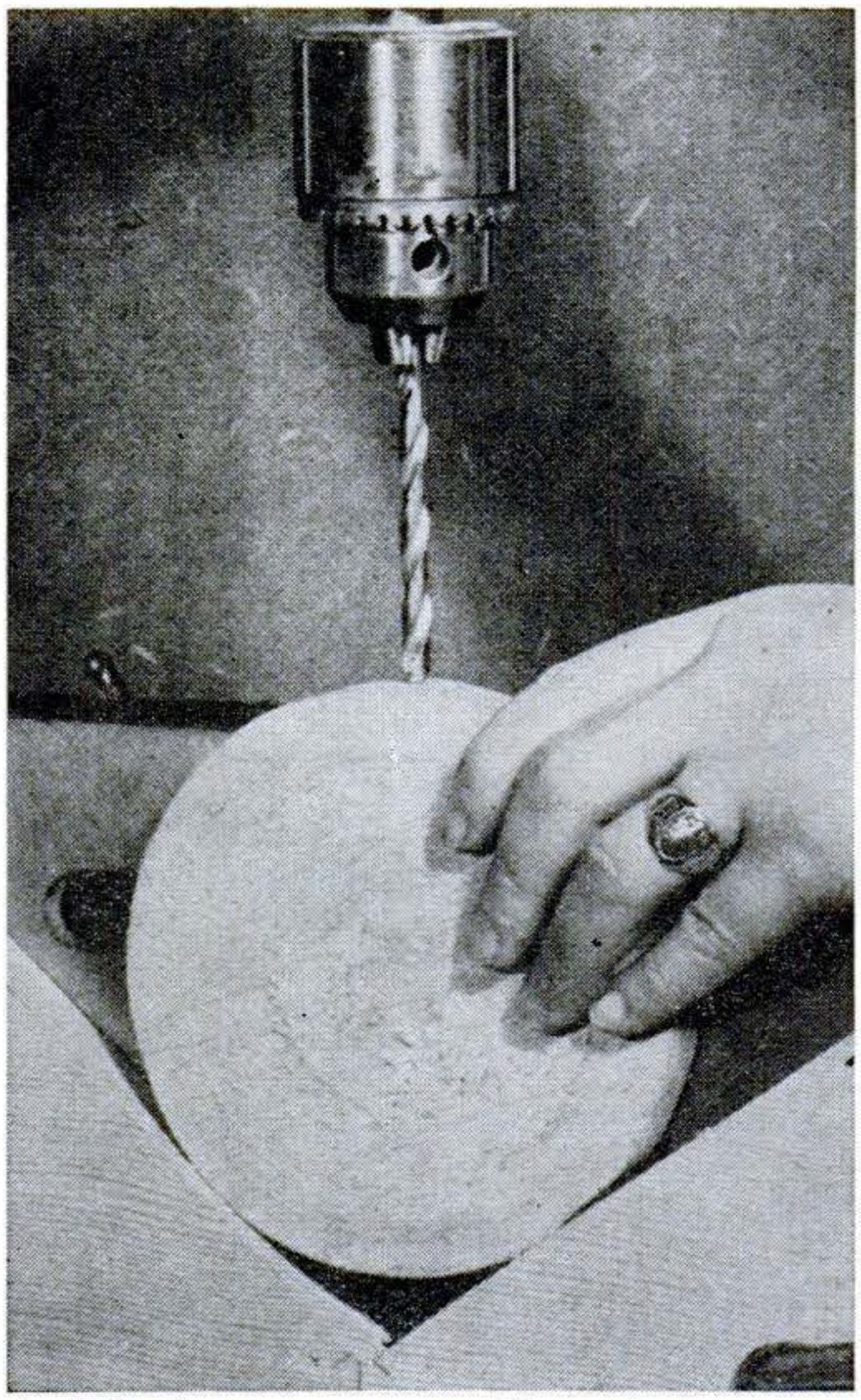
IF YOU use a drill press only for making holes in wood or metal, you are not getting full value from the machine. A drill press is, in fact, a versatile tool well suited to a wide variety of operations that will speed up and make much easier numerous jobs around a shop. Some of the extra tasks to which you may apply your press are illustrated in the photos on these pages.



Routing irregular shapes may be done with a pattern jigsawed from a scrap of thin stock. The inside of the pattern (at right above) and a wooden peg guide the router bit . . . .

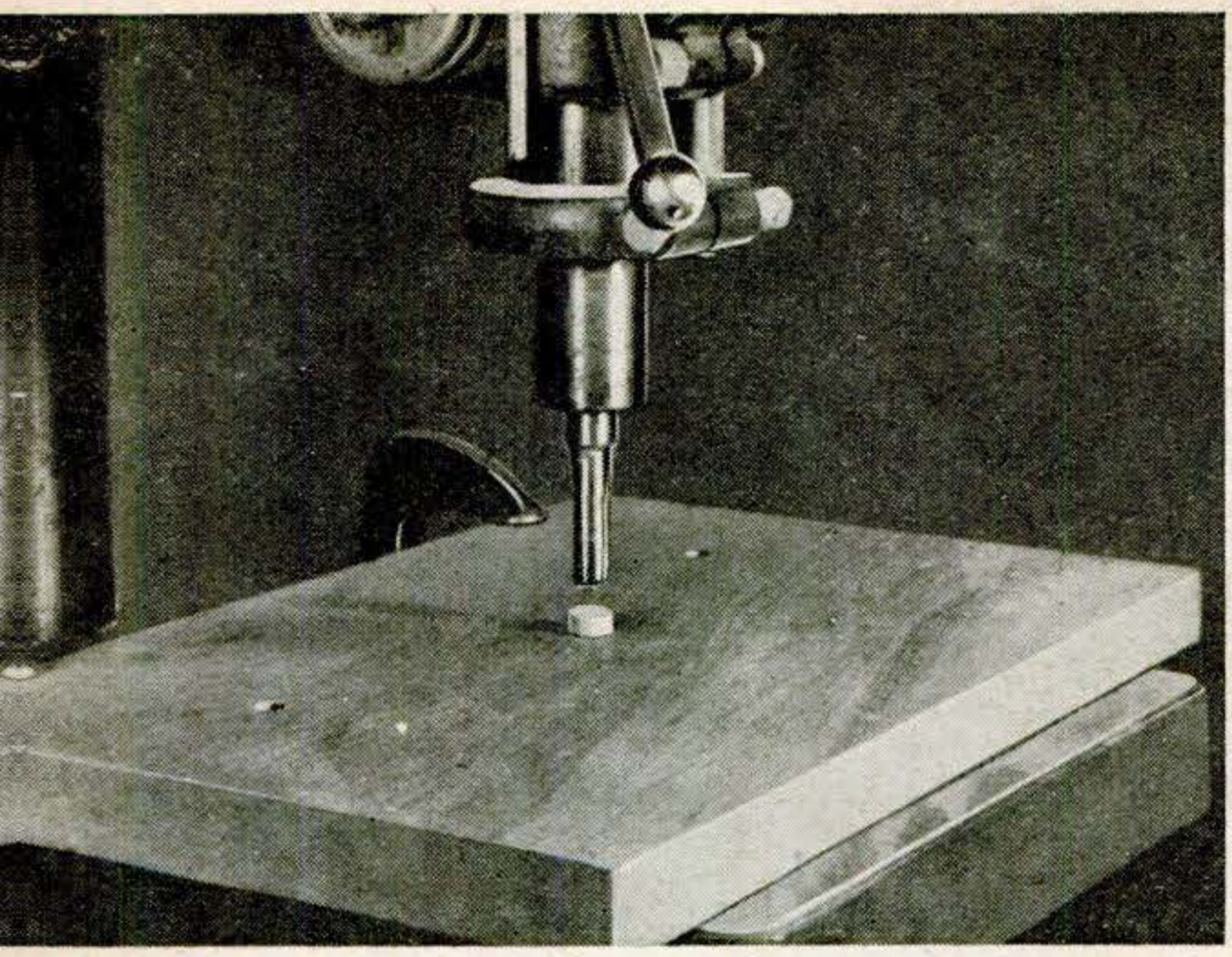


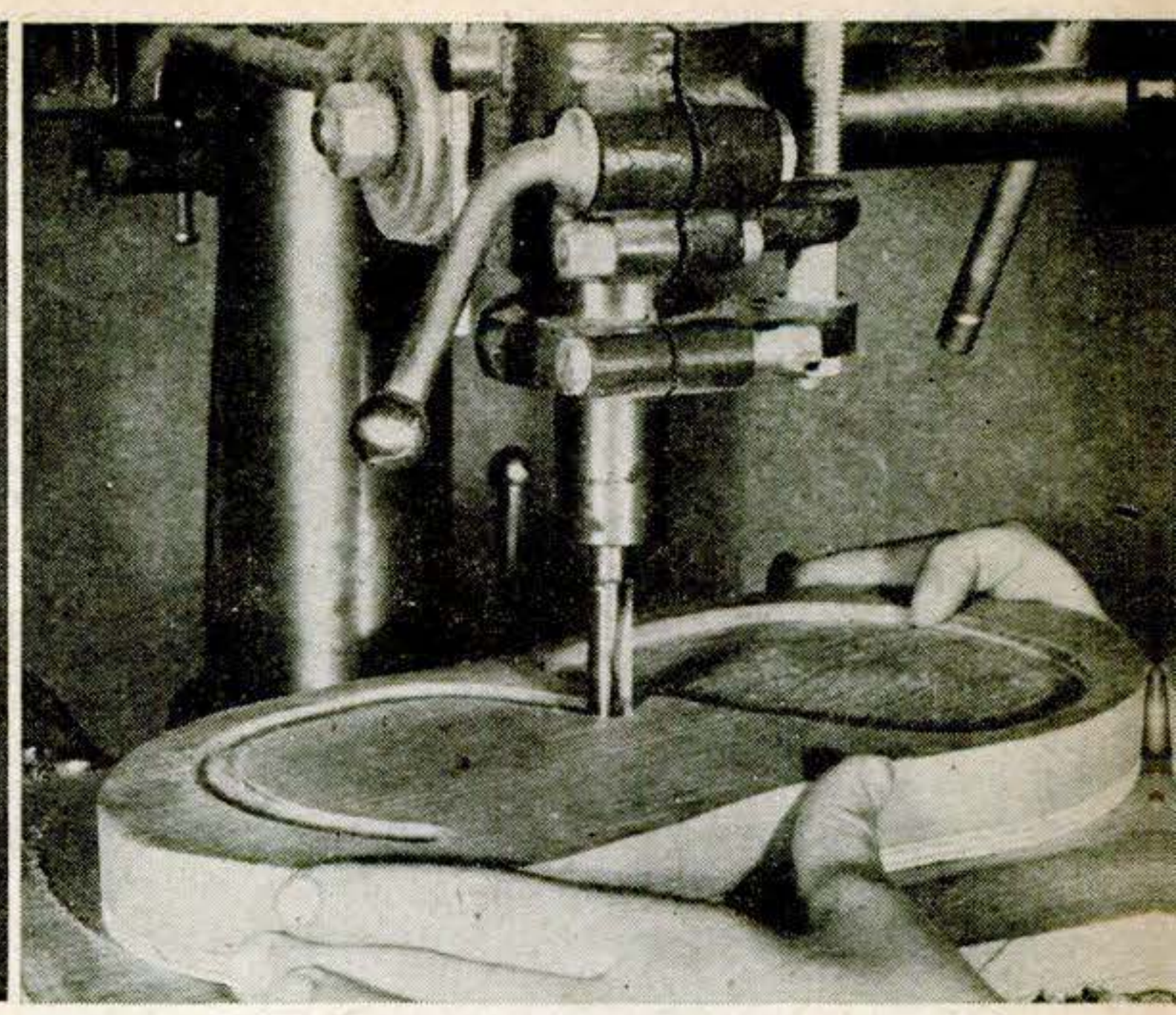
Holes in dowels usually are difficult to drill because the work rolls. This may be overcome with a V-block. Adjust the block so that the drill point is directly over the bottom of the V and clamp the block to the table to keep it in alignment while the dowel is being drilled.



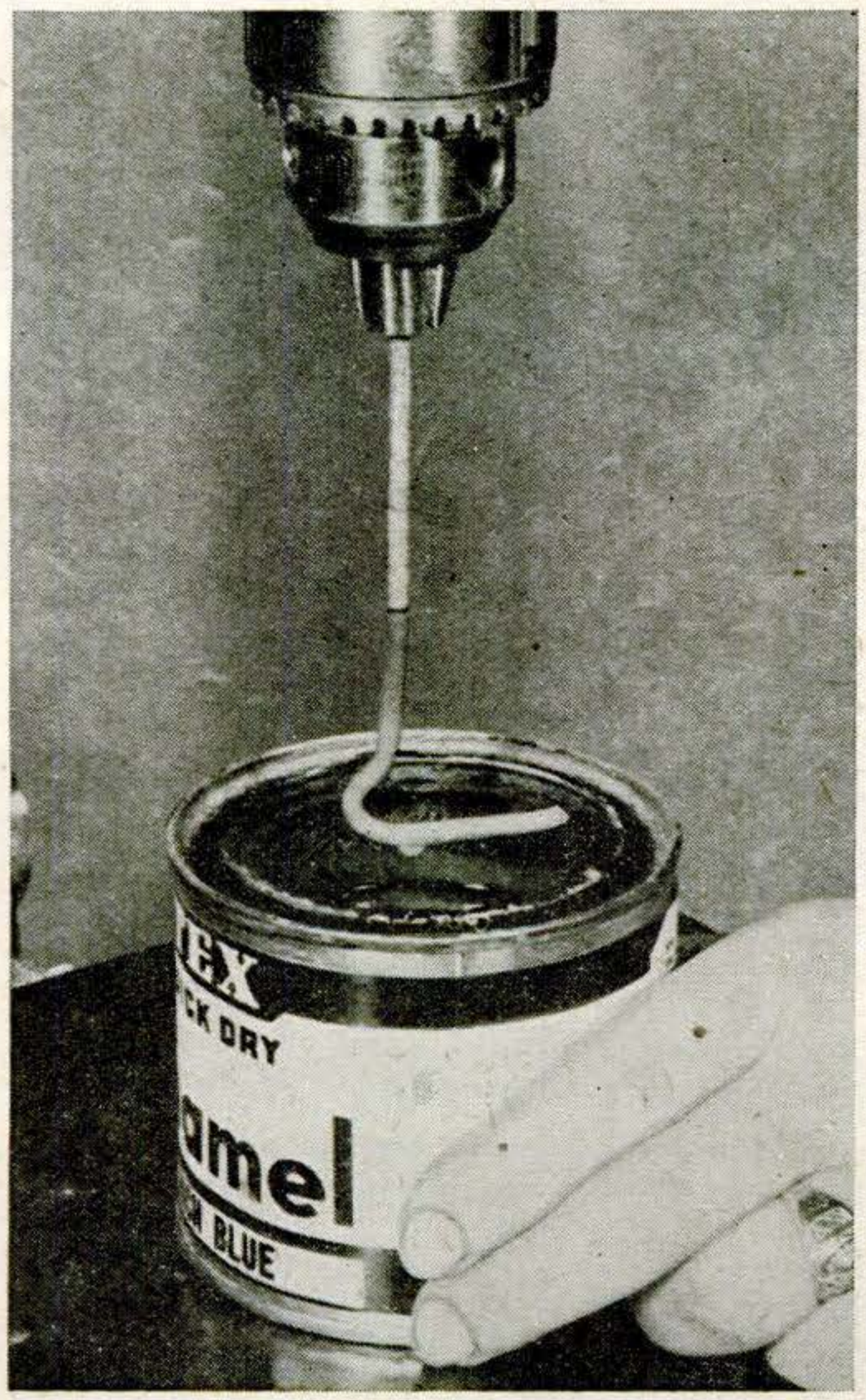
A disk also presents a problem when it comes to drilling a hole along a diameter. Again a V-block is the solution. Cut it from stock that is about as thick as the disk, set the table vertically, and clamp the block so the point of the V is aligned with the drill.

Copyrighted material

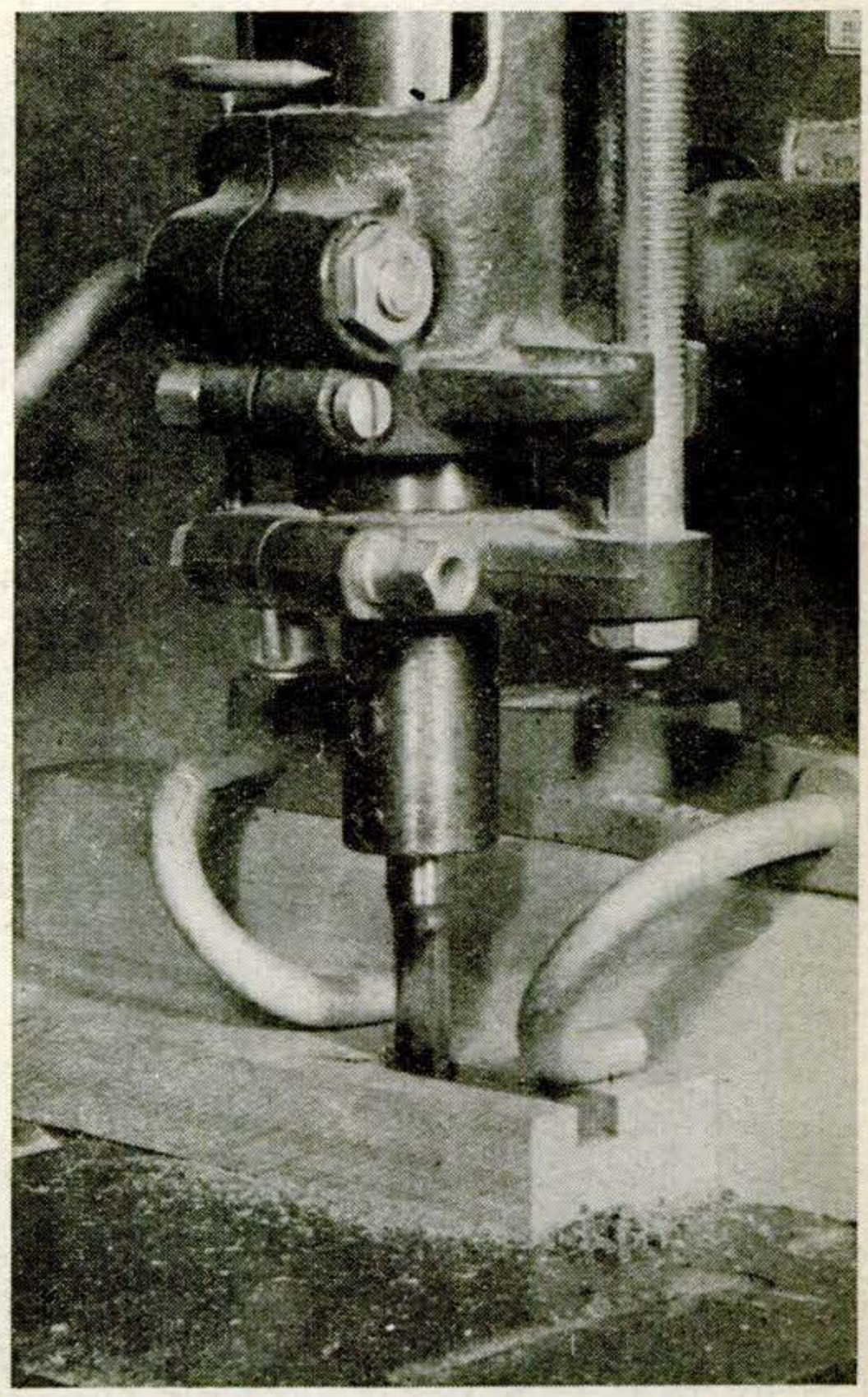




. . . Use a peg the same diameter as the bit and let it project a trifle less than the thickness of the pattern. Line up the peg under the bit, clamping the piece of wood in which it is set to the drill-press table. Tack the pattern to the bottom of the work and place it over the peg. Make the first cut around the edge of the area to be routed. Then clean out the inside.

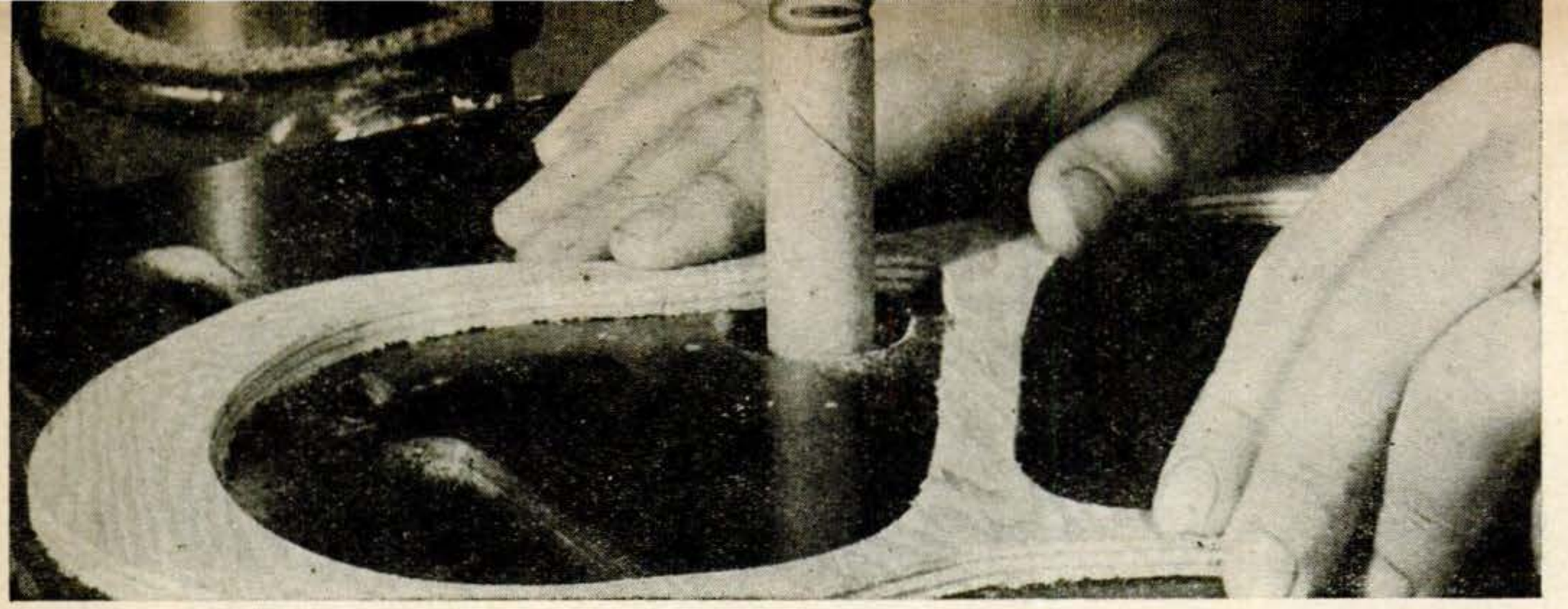


Paint stirring is one of the special jobs for which the drill press is well suited. Bend the end of a piece of stiff wire to a right angle and leave a shank long enough to extend from the chuck to the bottom of the can. To avoid spattering the paint, use a slow spindle speed.



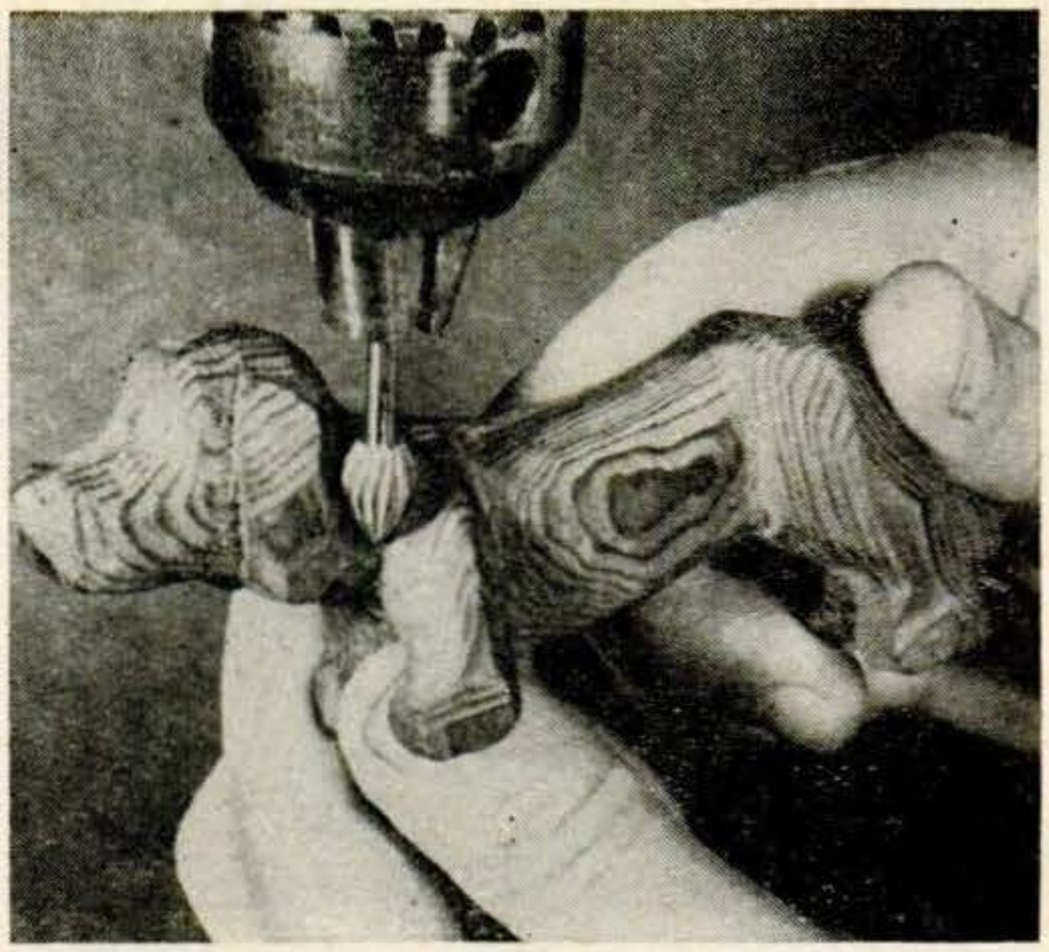
Drill-press routers are excellent for either straight cuts or pattern work. Use the bit in a regular routing spindle. For a straight cut, it is a good idea to use a fence equipped with a hold-down, as above, if one is available. A high speed (about 5,000 r.p.m.) gives a good cut.

Copyrighted material

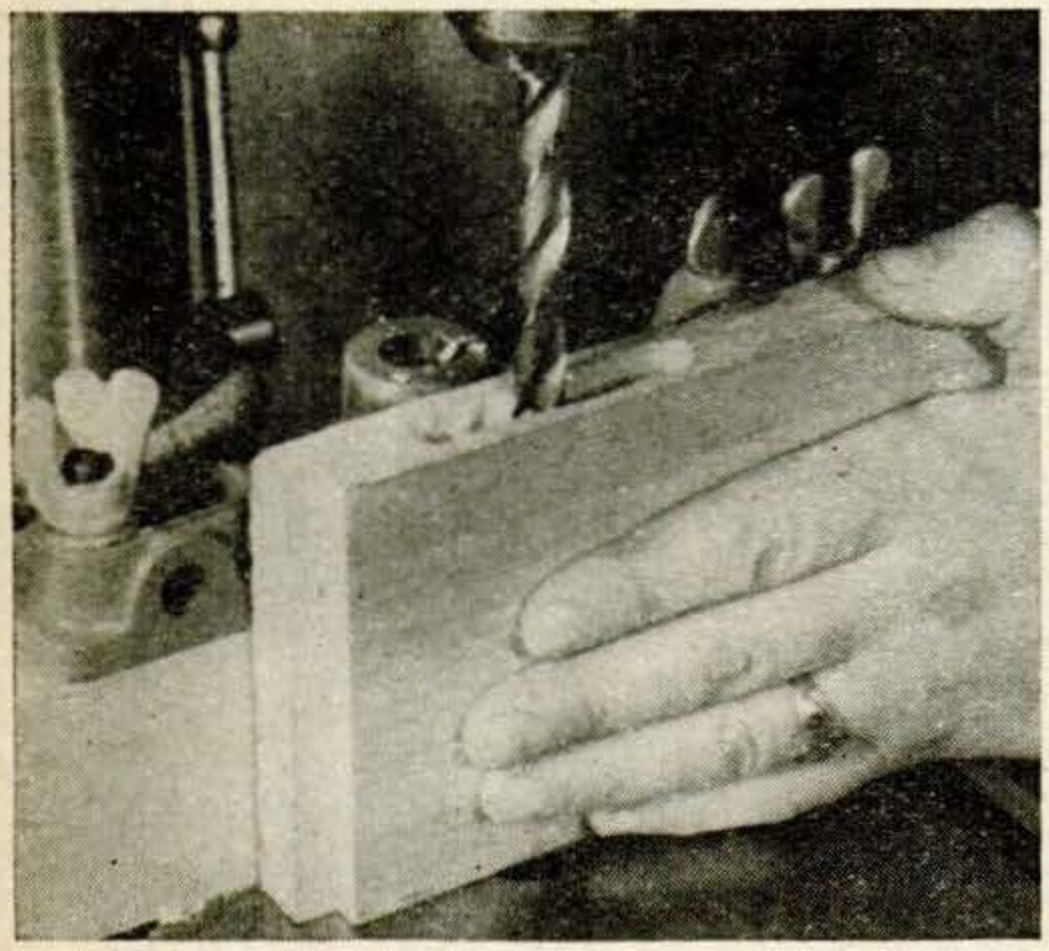


Drum sanders facilitate the sanding of curved edges. Since the sleeves are obtainable in a variety of grits, the entire sanding operation on a piece of work may be done on the press.

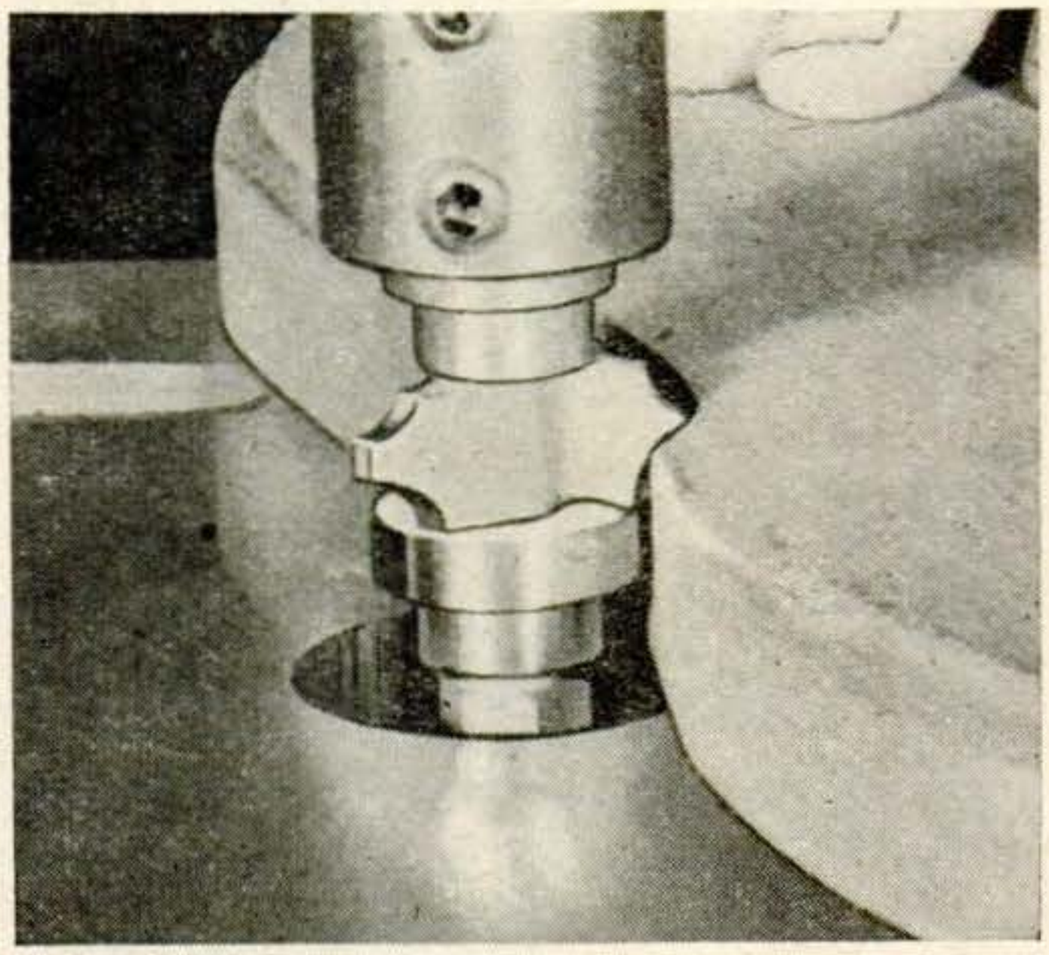
Cloth buffing wheels can readily be run on the drill press. Make a shank by cutting the head from a ⅜" bolt. Then clamp the cloth wheel between two washers and nuts on the bolt.



Carving may be done by using the small burrs designed for hand grinding tools. This leaves both hands free to control the work. Run the press at high speed to get a clean cut.



Round-end mortises are easily cut on a press. Hold the work against a fence and drill a series of overlapping holes, beginning at the left end. Extend the bit to the bottom of the last hole, lock the quill, and move the stock against the drill to clean out between the holes.

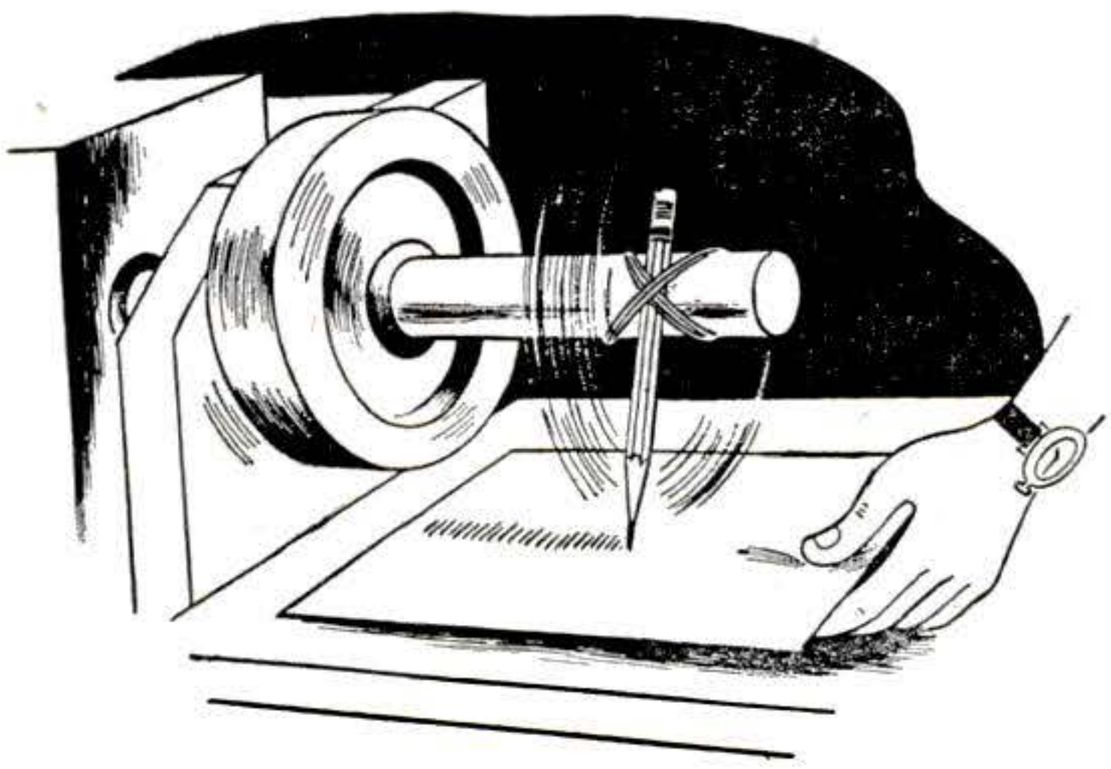


If you lack a shaper, you may do virtually the same work with a drill press. Set the table as high as possible so that the quill need not be extended. It is best to use only the cutters made for a drill press, for the larger shaper cutters exert too much side pressure.

Copyrighted material

WHAT'S YOUR I.Q.?

It Burns Me Up to read about people who set fire to good mattresses by smoking in bed. But I like to smoke in bed. Not caring to burn up, I got the base of an old gooseneck desk lamp, a two-part cigarette holder, and some plastic tubing. The tubing runs through the lamp-cord holes in the base. On the short end above the base I stuck the front end of the cigarette holder. The mouthpiece goes on the far end, and that's where I go. If I doze off while smoking, all's well.—SPEC COWDEN.



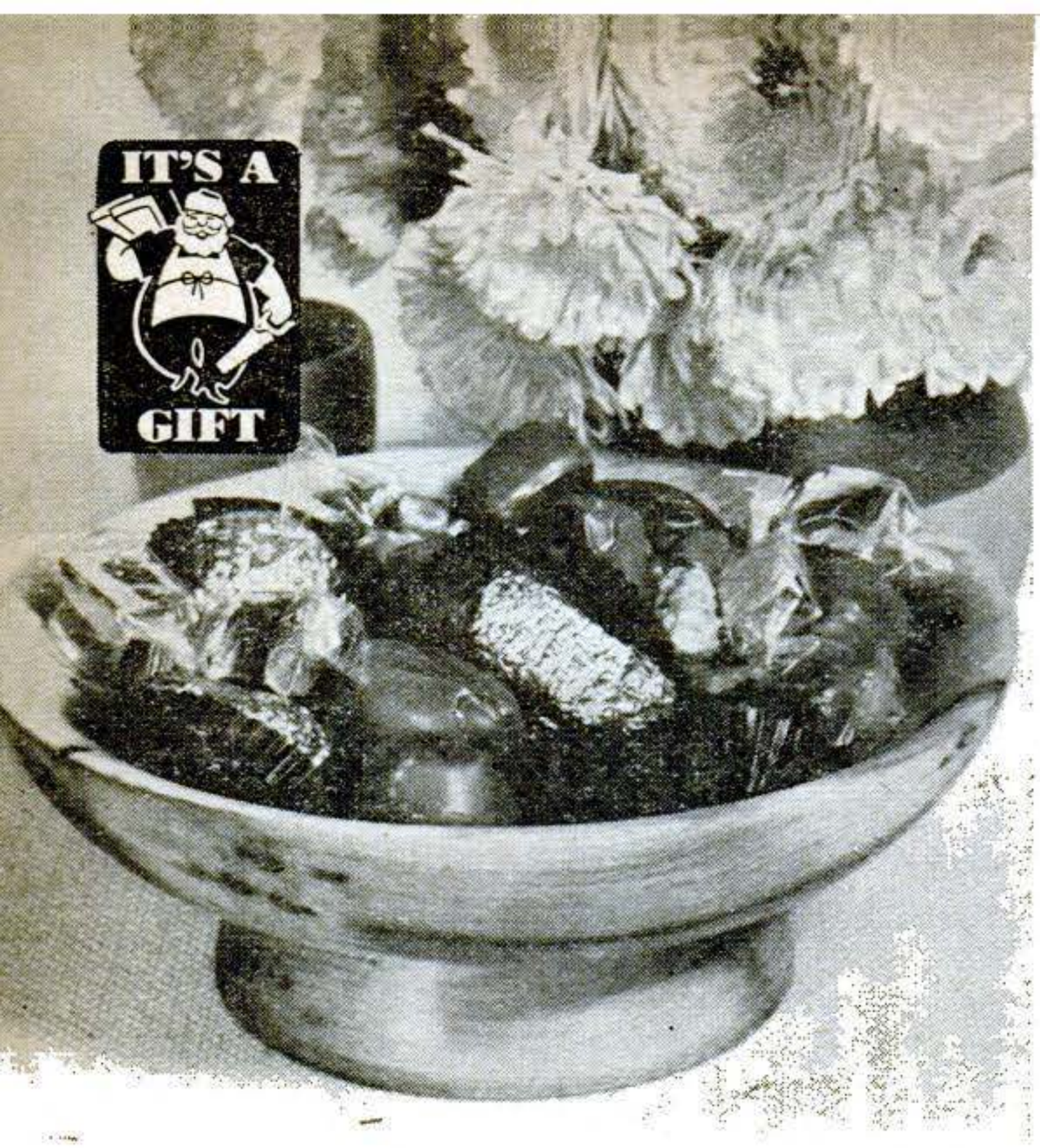
Take a Tachometer, if you have one. But if you haven't, here's a way to measure low shaft speeds. Slide the cardboard under the pencil for exactly 10, 15, or 30 seconds. Then count lines and multiply by 6, 4, or 2 for the r.p.m.—F. STRASSER.

Here's a New Twist on getting wires through awkwardly curved conduit. We had to put four conductors through a long piece shaped like a pretzel. The usual snake wire couldn't get by. Finally we used compressed air to shoot through some light cotton string. With this we pulled through the snake, and with that the wires.—L. PROVENZ.

Blockheaded Ice Cubes wouldn't go into the round neck of my lunch-time thermos, and, by letting them melt enough to fit, I'd waste most of the ice. So I cut some 1″ aluminum tubing into 2″ lengths and used them as molds for ice. The round "cubes" are a fine fit for the thermos. So my drink stays cold.—VICTOR E. ELIASON.

Have you pulled off a smart one lately? We will pay for acceptable contributions showing ingenious solutions of problems in the home, shop, garage, or camp. It doesn't matter if it's wacky—if it works.

Copyrighted material



Turned Bowl Serves Bonbons to Music

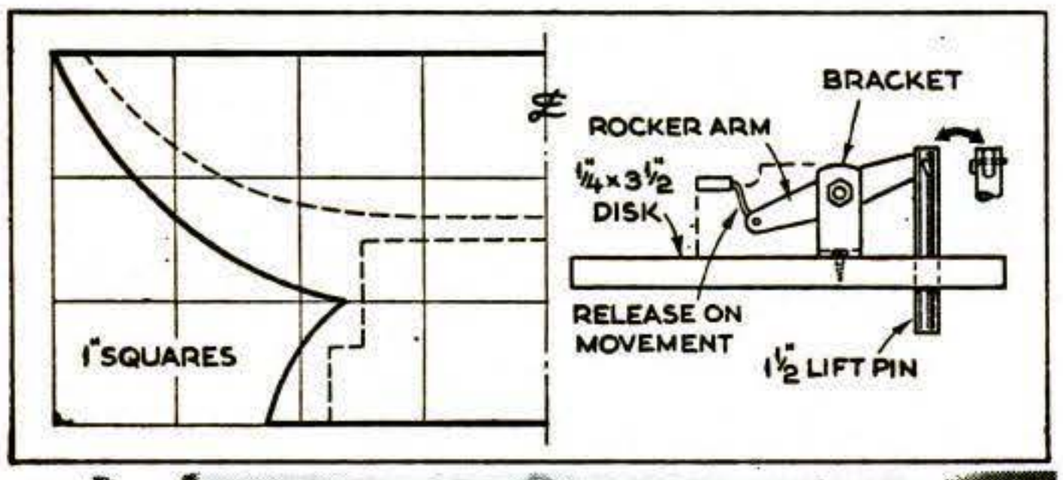
WHEN you pass the candy in this turned bonbon bowl, a Swiss music-box movement strikes up a tinkling tune. The music stops when the bowl is returned to the table. It's shown in color on page 136.

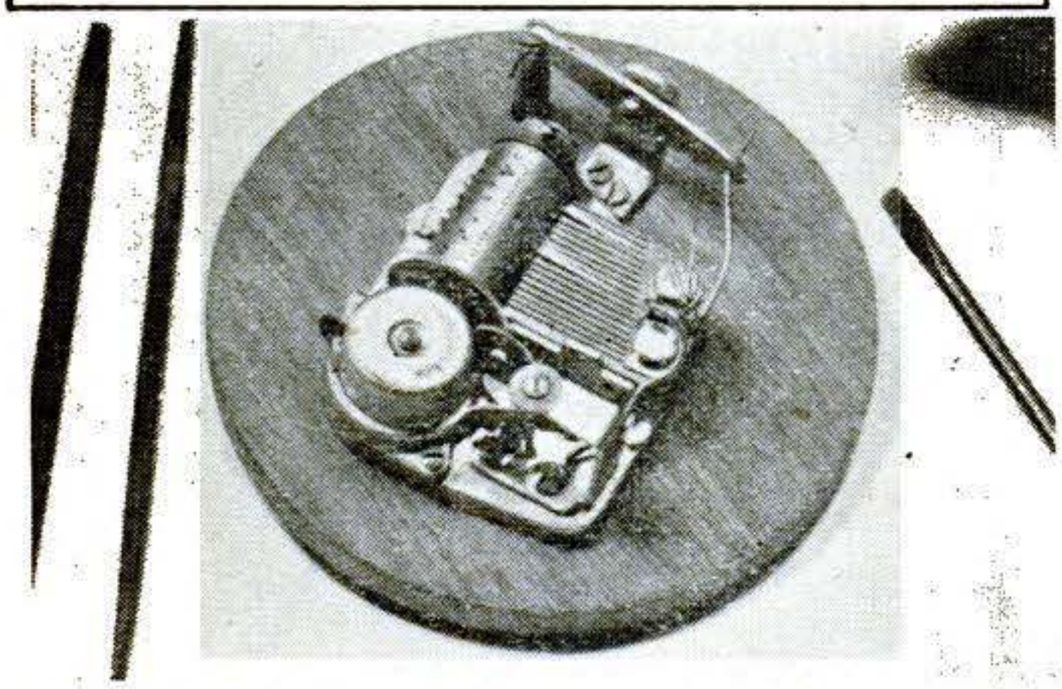
Mounted on a sounding board, the music movement is concealed in a space hollowed out of the base of the bowl. Ordinarily, such movements start when a weight is lifted and stop when it is replaced, but the action is reversed here by addition of a small bracket, rocker arm, and lift pin. Placing the bowl on a flat surface pushes up the pin, the rocker arm depresses the trigger, and the movement is turned off. When the bowl is picked up, the weight of the pin pulls down the arm, and the music is allowed to play.

Make the rocker arm and bracket from 16-gauge sheet brass and use a 1½″ length of 3/16″ drill rod as the pin, slotting the end to take the rocker arm.

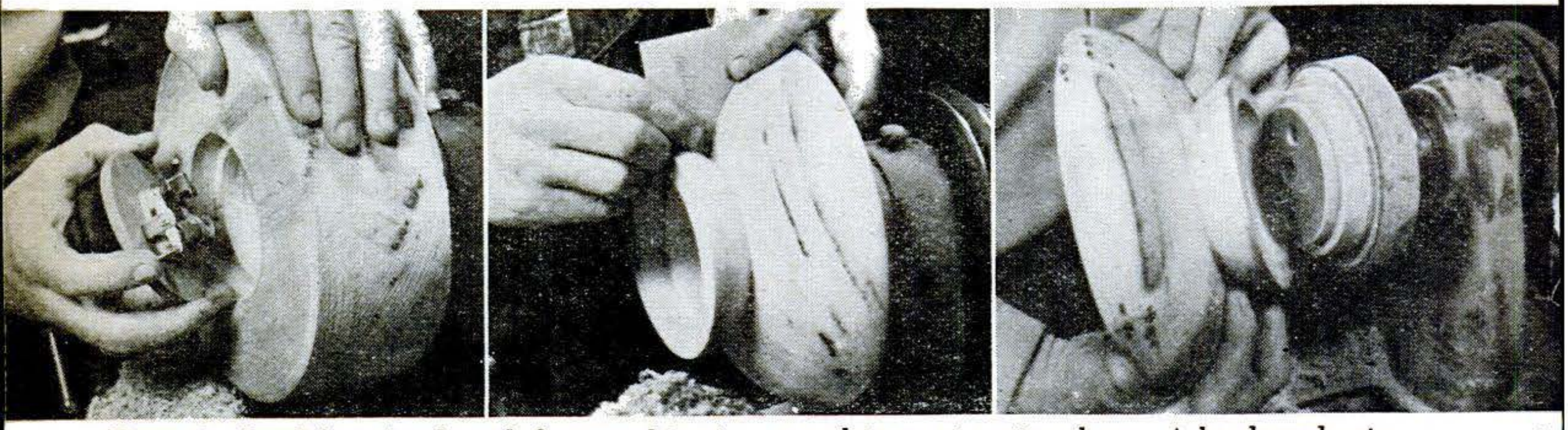
Turn the bowl from a 3″ by 8″ disk of hardwood. Screw the block to the faceplate, rough-turn to 8″ diameter, and face. Next turn down a shoulder to suit the sounding board and cut a recess for the movement. Check contours with a template as the turning of the outside progresses.

To hold the work while the inside of the bowl is being turned, screw a block of hardwood to the faceplate and turn a stepped chuck that fits tightly in the recess diameters. Sand the entire bowl while it is still on the chuck, then shellac, and finally polish with paste wax.—DORIS ALLER.



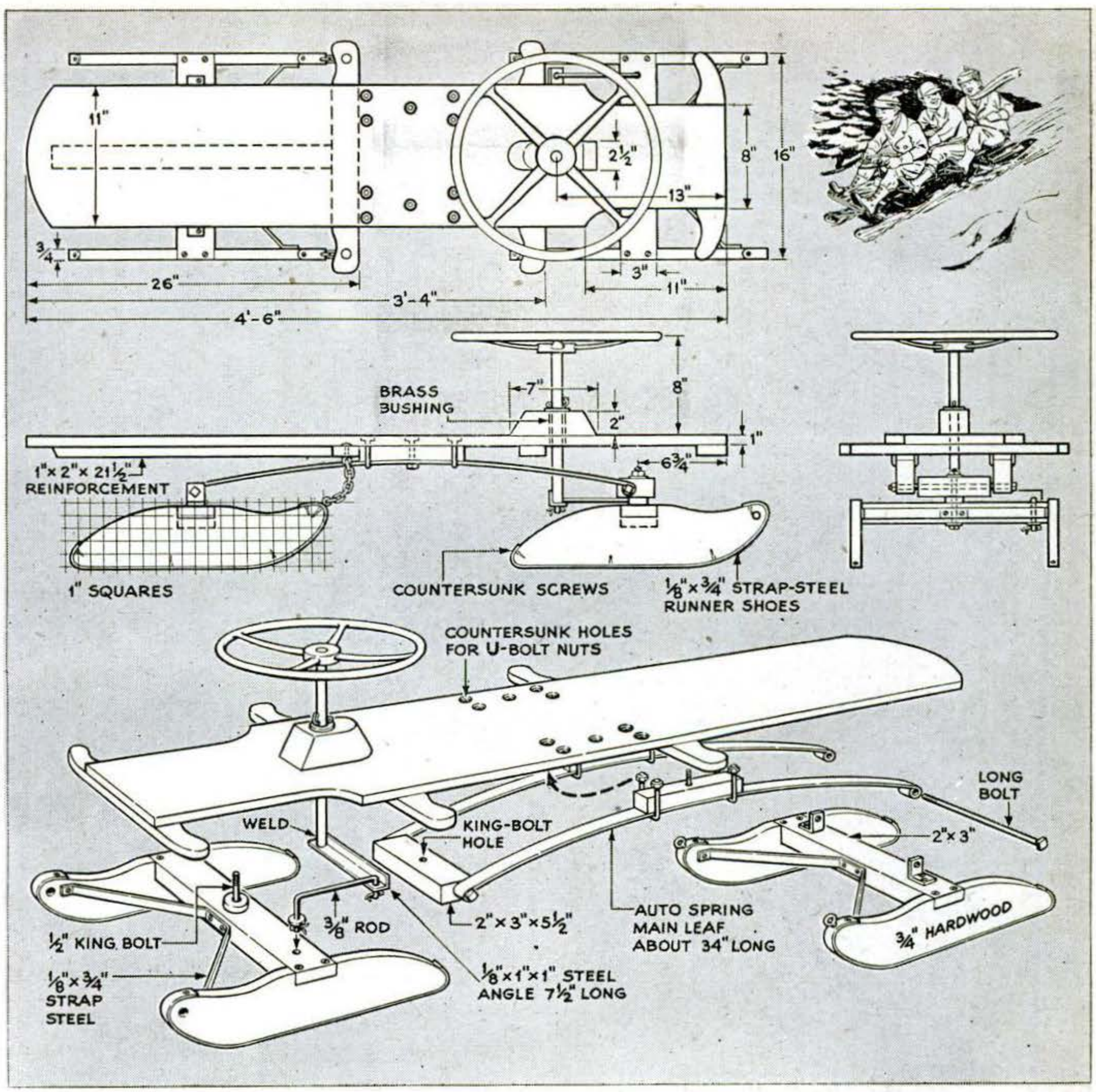


Cut a 3½″ disk from ¼″ stock as the sounding board. Mount this with screws in the recess.



Turn the bowl from hardwood, first roughing it to 8″ in diameter. Then turn out a recess for the movement. In turning the outside, use a template as at center above. A hardwood spindle chuck turned to fit the bottom recess (right) holds the work as the inside is turned.

Copyrighted material



Two main leaves from an old auto spring provide a cushioned ride on the roughest hill.

Three-Place Bobsled

BEFORE the snows come this winter, why not make this bobsled ready for the first fall? Carrying up to three persons, it's sprung on all four runners to give a smooth ride whatever the speed.

For the springs, select a pair of long main leaves from any light make of car at a wrecking yard. Secure each to the seat plank with two U-bolts over a block, countersinking the nuts flush with the plank surface. Also pass a carriage bolt through the hole in each leaf, the block and the plank.

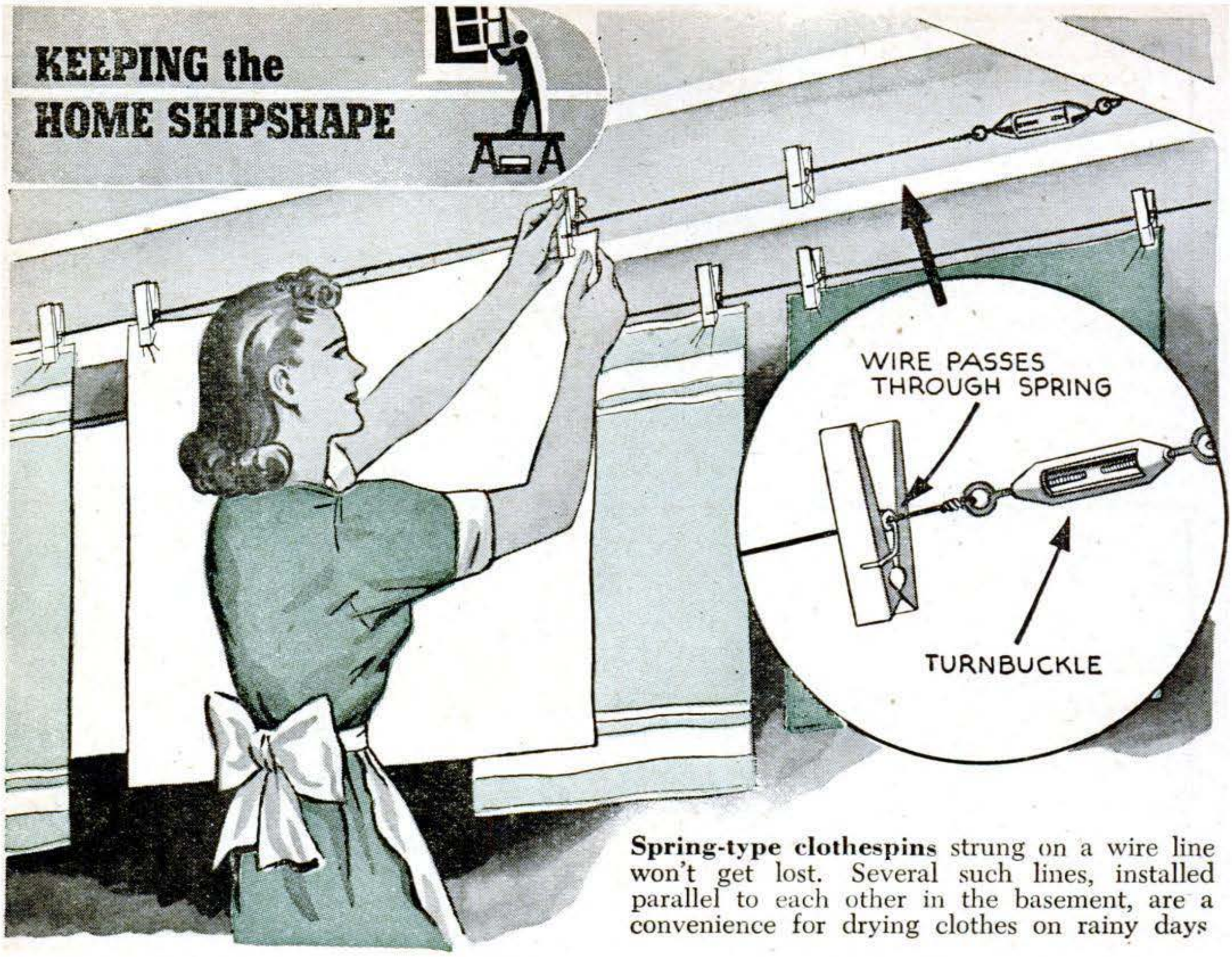
Each truck is braced by a length of strap iron installed diagonally. The rear truck is kept from swinging wide by chains that run from screweyes at the top front of each runner to the rear footrest. A 1" by 2" by 21½" reinforcement is desirable under the overhanging rear portion of the seat plank.

The sled is steered by means of an arm welded to the bottom of the post and linked to the outer end of the front-truck beam. If available, an old auto steering wheel might be used here. A cotter pin over a washer keeps the steering post in place, and the post turns in a brass bushing.

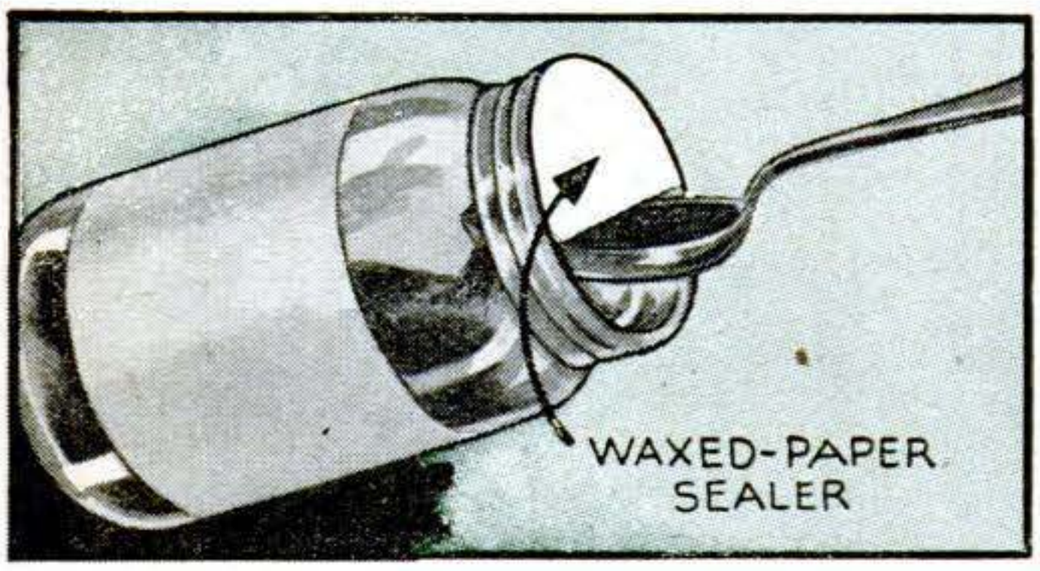
By substituting wood axle beams for the trucks and putting on coaster wheels, you may easily convert the sled into a speedy summer coaster wagon.—HI SIBLEY.

Copyrighted material

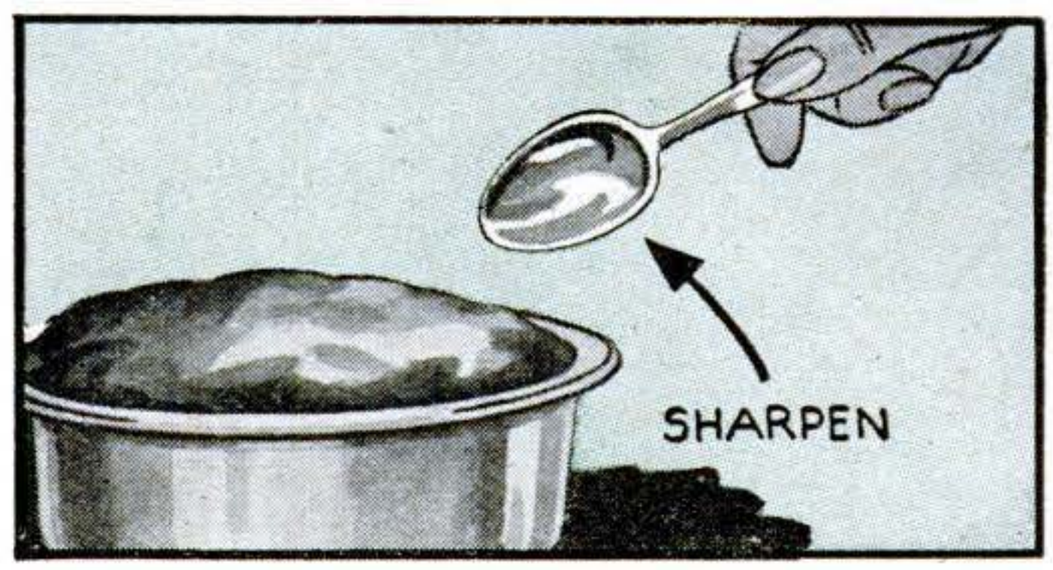
KEEPING the HOME SHIPSHAPE



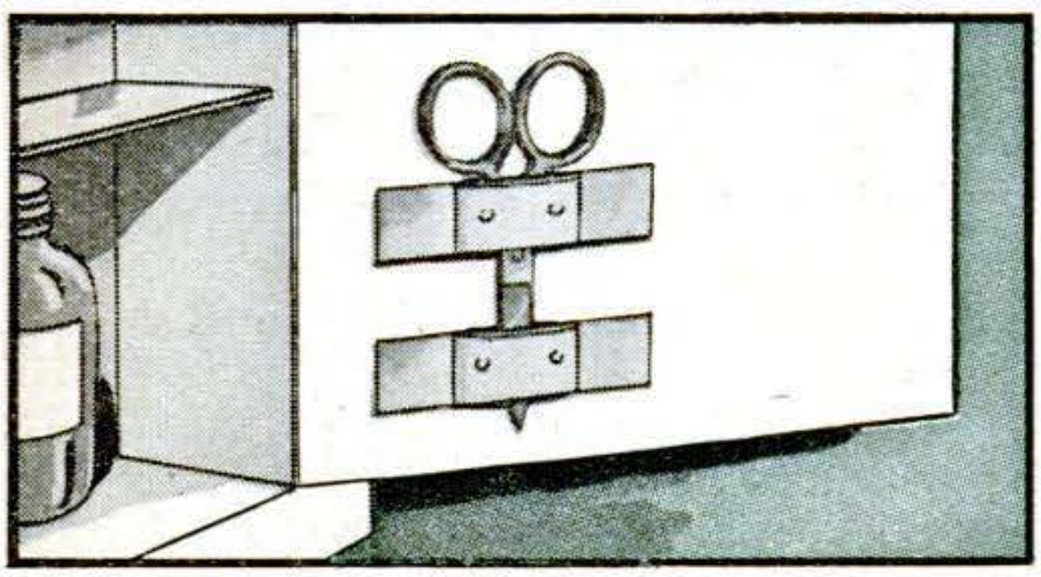
Spring-type clothespins strung on a wire line won't get lost. Several such lines, installed parallel to each other in the basement, are a convenience for drying clothes on rainy days



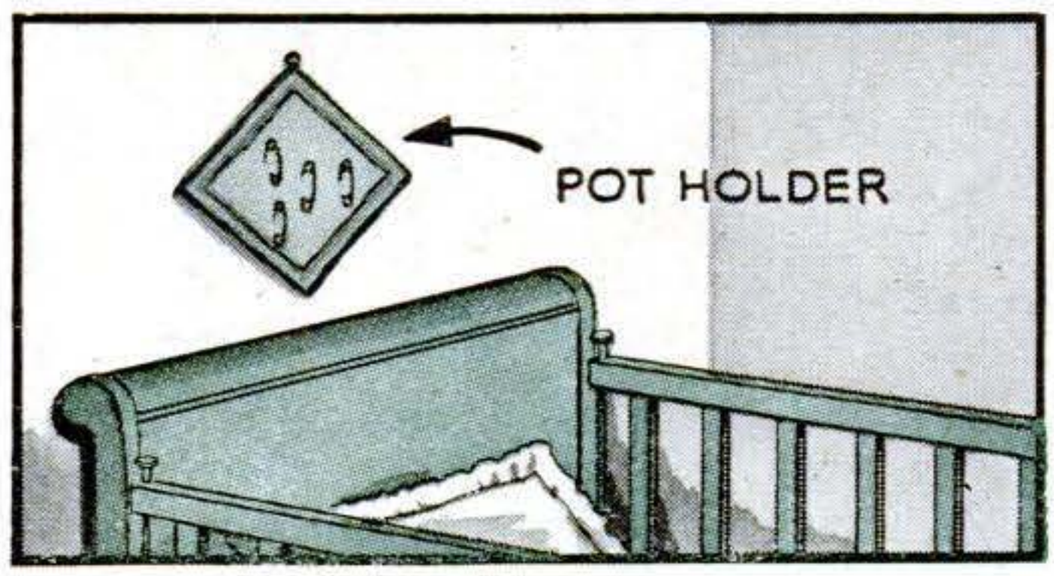
Instant coffee, being a fine powder, tends to heap on the spoon so that too much is used. By cutting away just half of the seal found under the lid you'll have a handy leveler.



When cutting portions of puddings, fruits, hard-topped casserole dishes, and the like, a serving spoon with one edge sharpened will make the work easier and the results neater.

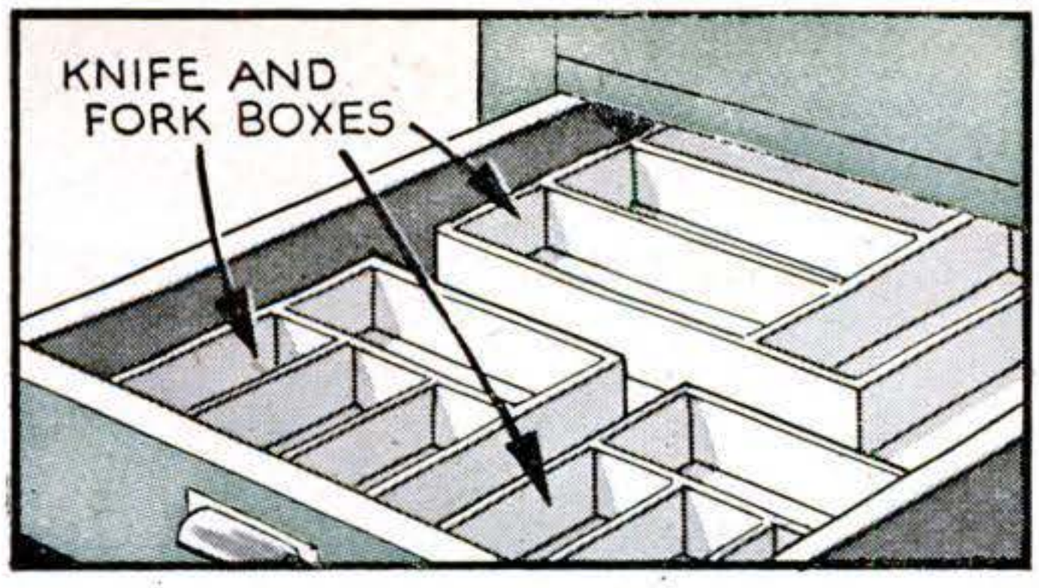


A pair of scissors may be kept at hand in the bathroom by making a holder from two adhesive bandages. Attach the holder inside the door of the medicine cabinet or under a shelf.

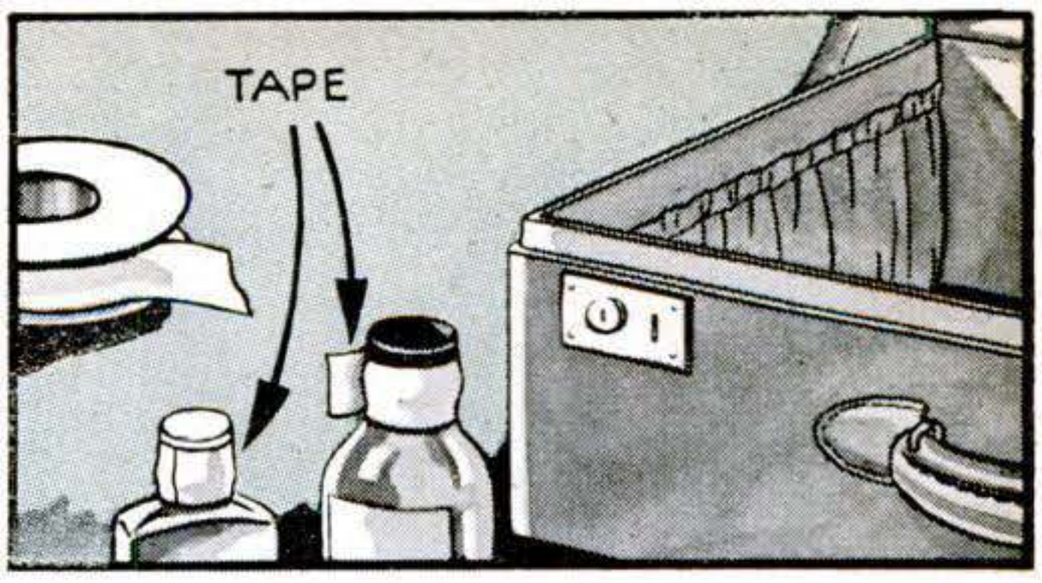


A decorative pot holder attached to the wall several feet above the crib or dressing table provides a handy and safe place to park open safety pins while changing a baby's diaper.

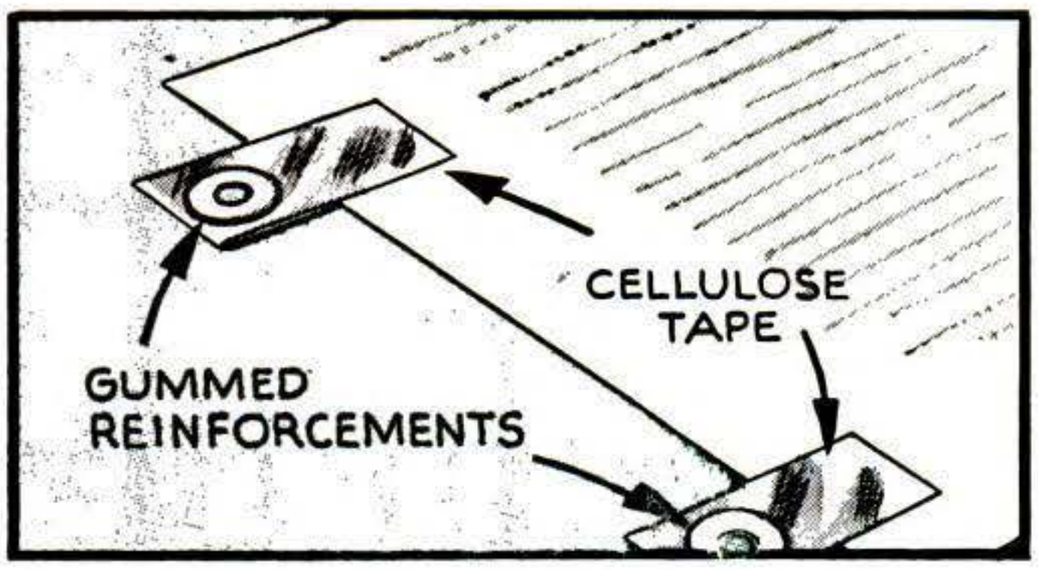
Copyrighted material



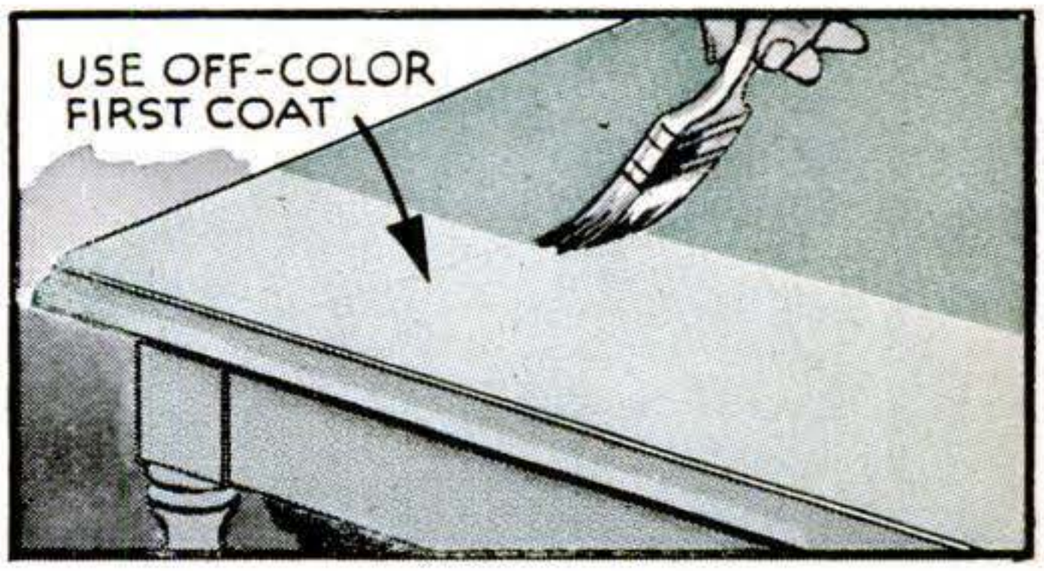
Silverware boxes sold in dime stores provide an efficient way of partitioning large bench and desk drawers for storage of small tools, desk supplies, and other miscellaneous gear.



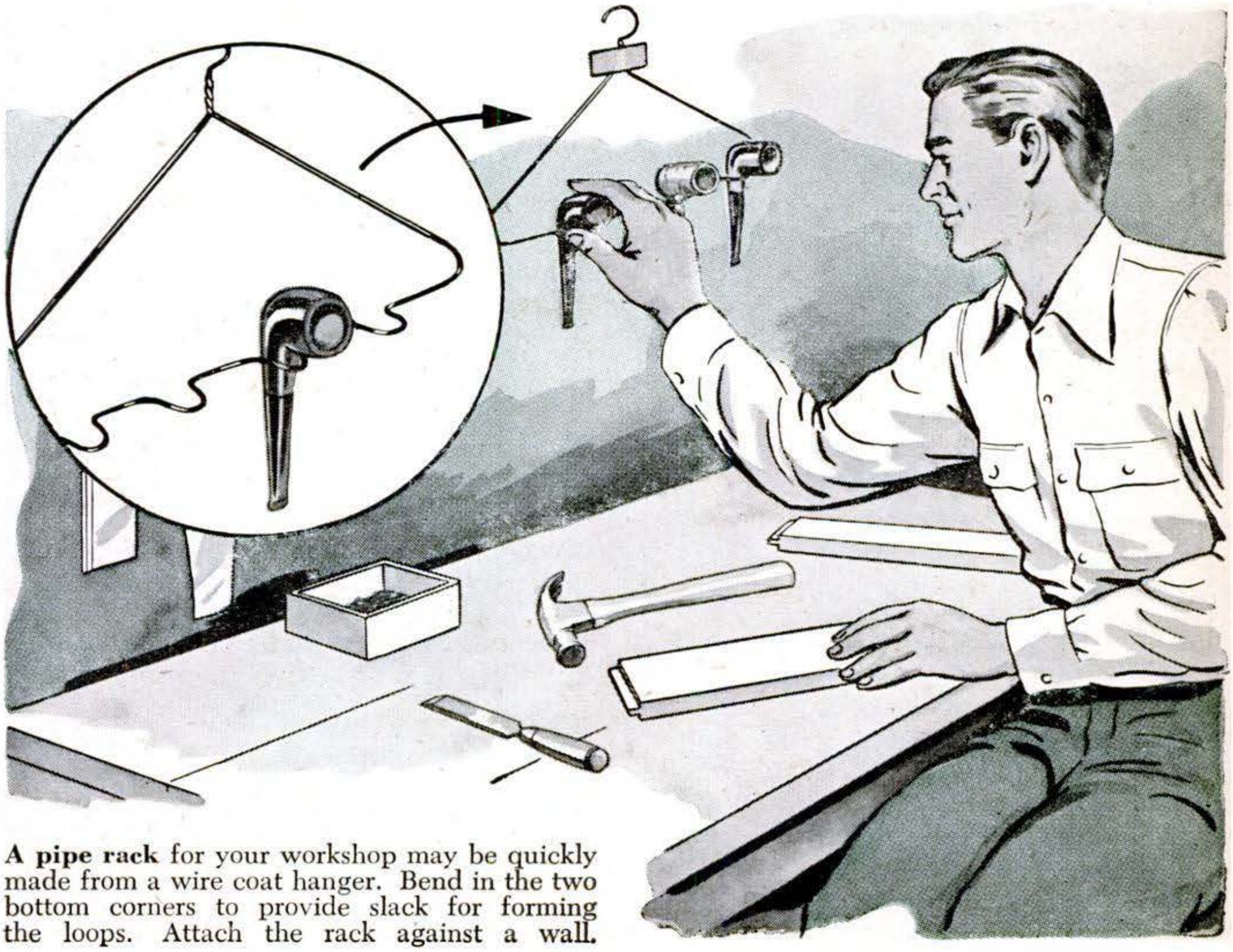
Adhesive tape wound tightly around the top of the bottle will prevent nail polish, perfume, and other liquids from being spilled in your bag. Carry a roll of tape for the purpose.



Sheets of paper that can't be punched because of insufficient margin may be mounted in ring binders as seen above. Use two reinforcements inside each of the strips of folded cellulose tape.



When painting, make the first coat slightly off color by stirring in a little paint of a different color. Then, in applying the second coat, you can avoid leaving unpainted spots.

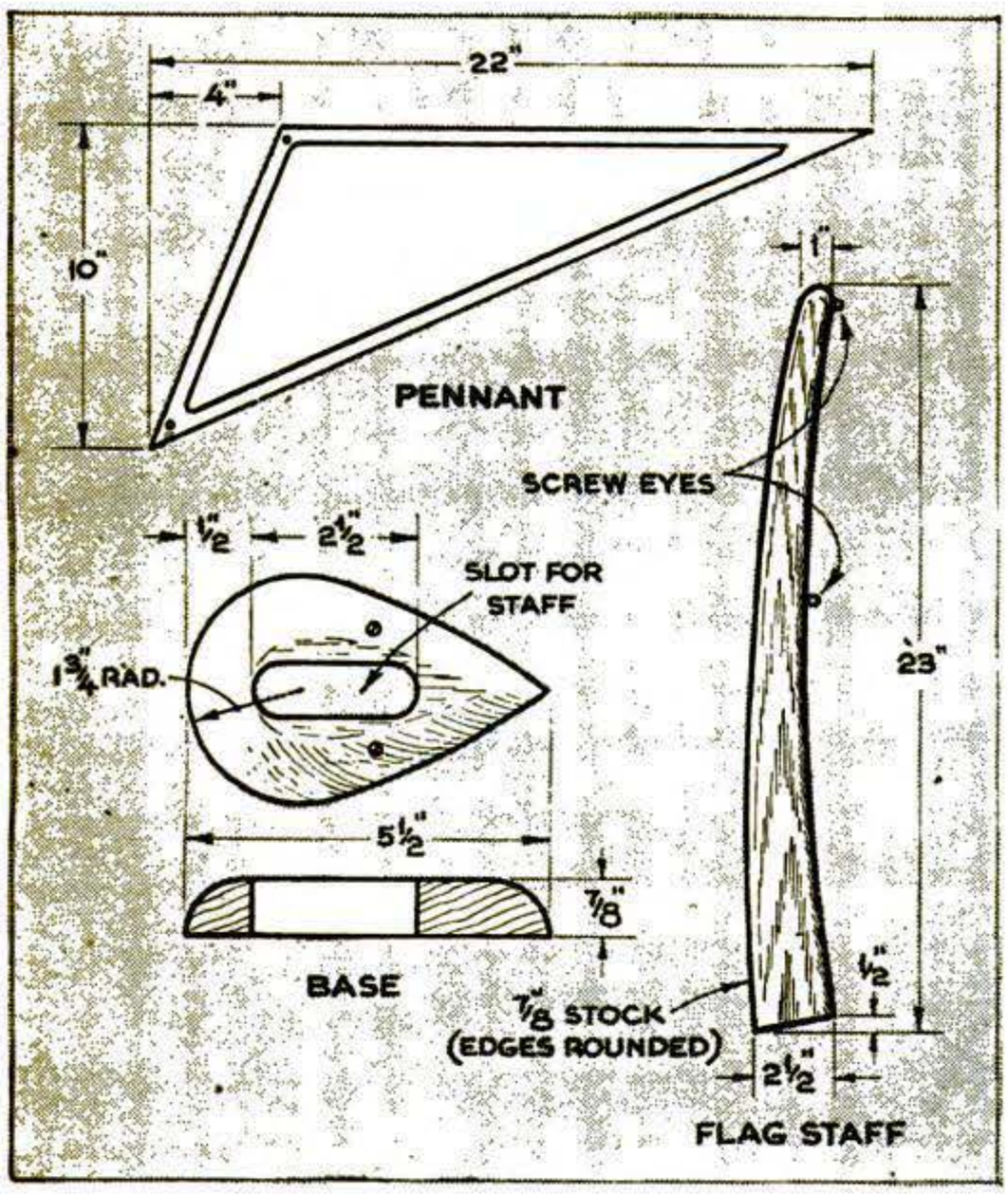


A pipe rack for your workshop may be quickly made from a wire coat hanger. Bend in the two bottom corners to provide slack for forming the loops. Attach the rack against a wall.

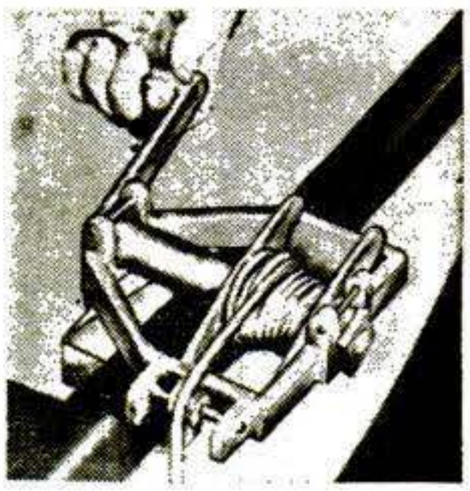
Copyrighted material

For Boats and Boating

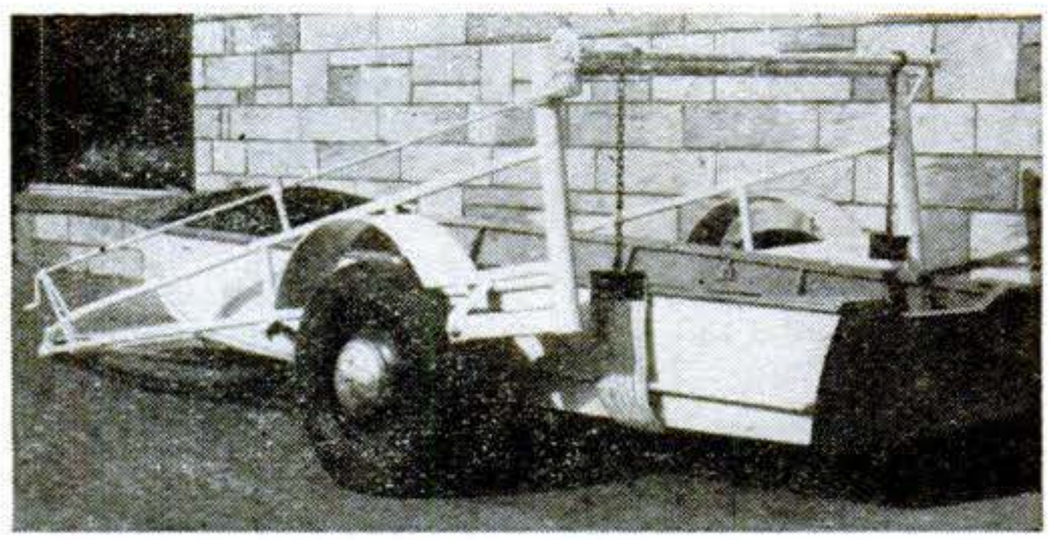
Pontoons Stabilize Boat. An outrigger unit consisting of two pontoons on telescoping steel arms is made by the Lee-Neal Company, Minneapolis, Minn. The rubberized-fabric pontoons are easily inflated by mouth, and clamps attach the arms to the boat. For passing through narrow channels, the pontoons may be quickly brought inboard. The 18-lb. unit is designed for a duckboat, canoe, or rowboat.



Staff Flies Pennant. For the best appearance, use walnut or mahogany in making this pennant staff. Cut out paper templates of the staff and base, transfer to the wood, saw to shape, round the corners, and sand smooth. Cut a slot in the base for the staff and drill three holes for screwing to the boat. Assemble with waterproof glue and apply three coats of spar varnish. Cut a pennant as shown.—JOSEPH S. CORLE.

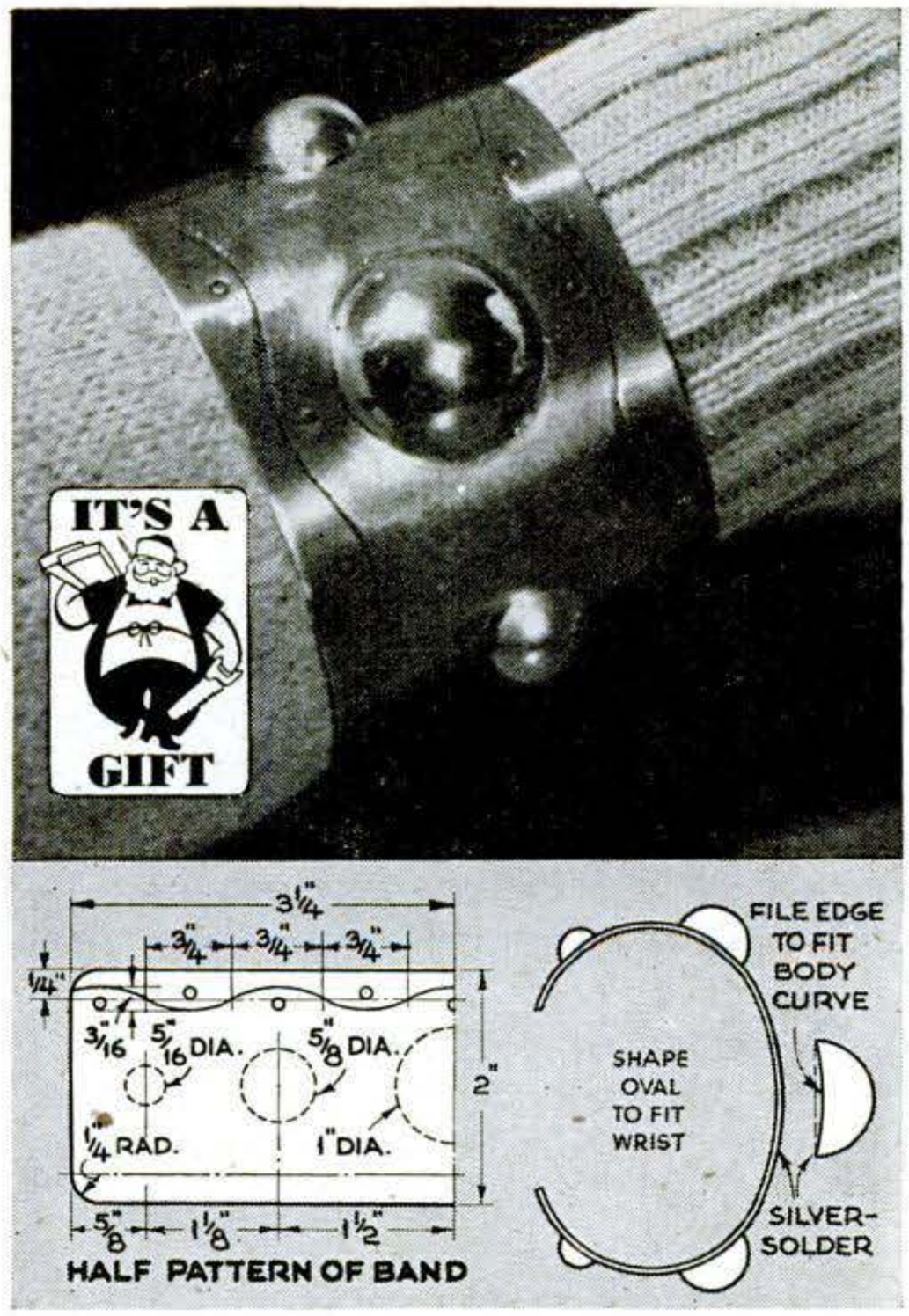


Anchor Lift. Consisting of a hand crank and reel, this anchor lift is light in weight and may be quickly clamped to the side of any small boat. Approximately 50′ of anchor rope winds on the reel. The device is distributed by Auto Coach Sales, Inc., of Michigan City, Ind.



Winch Raises Boat. A boat trailer made by the E-Z Manufacturing Company, Omaha, Neb., is designed for one-man loading and launching of boats up to 16′ long. A winch at the rear eliminates manual lifting, the stern of the boat resting in a canvas sling that may be raised or lowered with the winch. Two models of the trailer are made, one for boats with beams up to 64″ and another for those with beams up to 54″.

Copyrighted material



Hand-Hammered Slave Bracelet

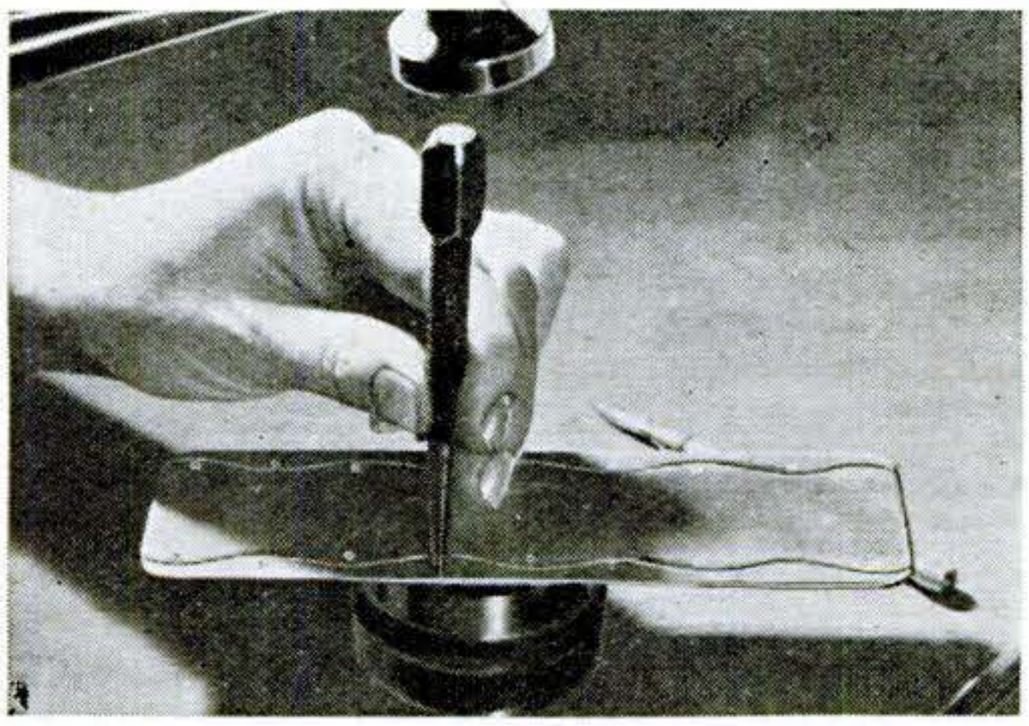
ALTHOUGH this bracelet has the heavy, massive appearance of the traditional slave type, it nevertheless is comfortable to wear because the hollow construction of the decorative balls makes it quite light.

The body requires a 2" by 6½" piece of 18-ga. sheet silver, brass, copper, or craft alloy. Work out the edge design on paper full size, transfer it with carbon paper, and scribe locating circles for the balls.

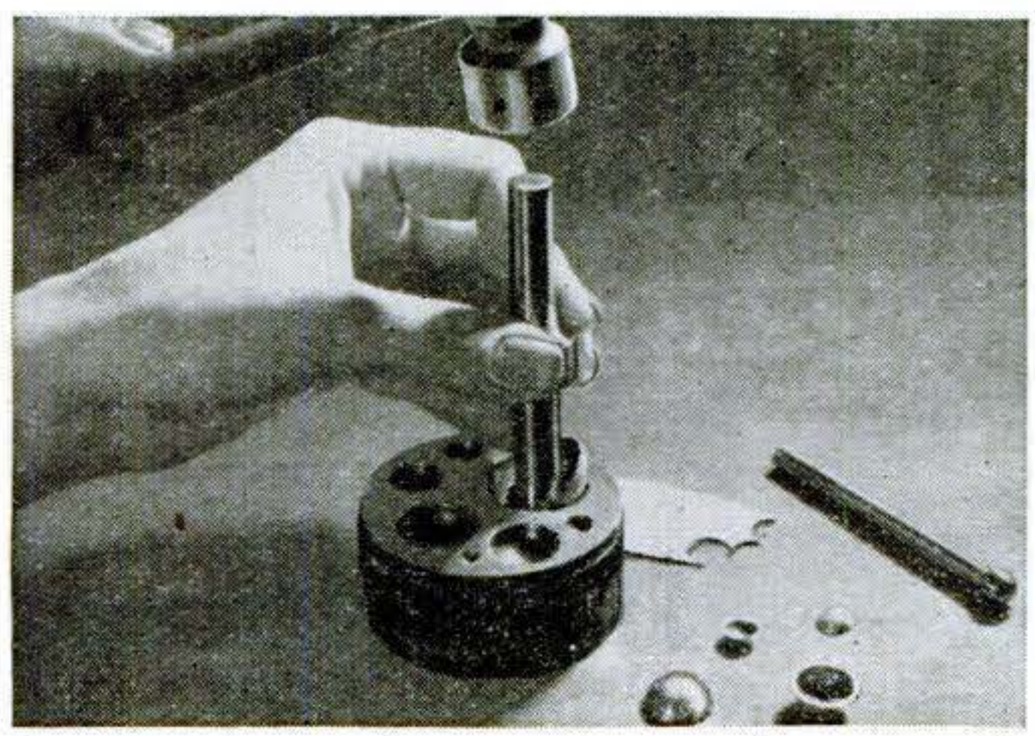
A nail set may be used to indent the small circles, while a punch shaped like a small cold chisel will follow the curved lines. When the design is complete, round the corners and bend the bracelet to the oval shape shown in the drawing, leaving an opening just large enough for the wrist. Note the taper from front to back shown in the photo above.

Form the hollow hemispheres from 18-ga. disks, using a dapping block and round nose punch or, lacking this, steel balls and a hollowed hardwood block. The large knob requires a 1¼" disk, the others ¾" and 7/16" disks. File the bottoms of the hemispheres to fit the curvature of the bracelet where they join. Remove all hammer marks with a fine file and abrasive cloth.

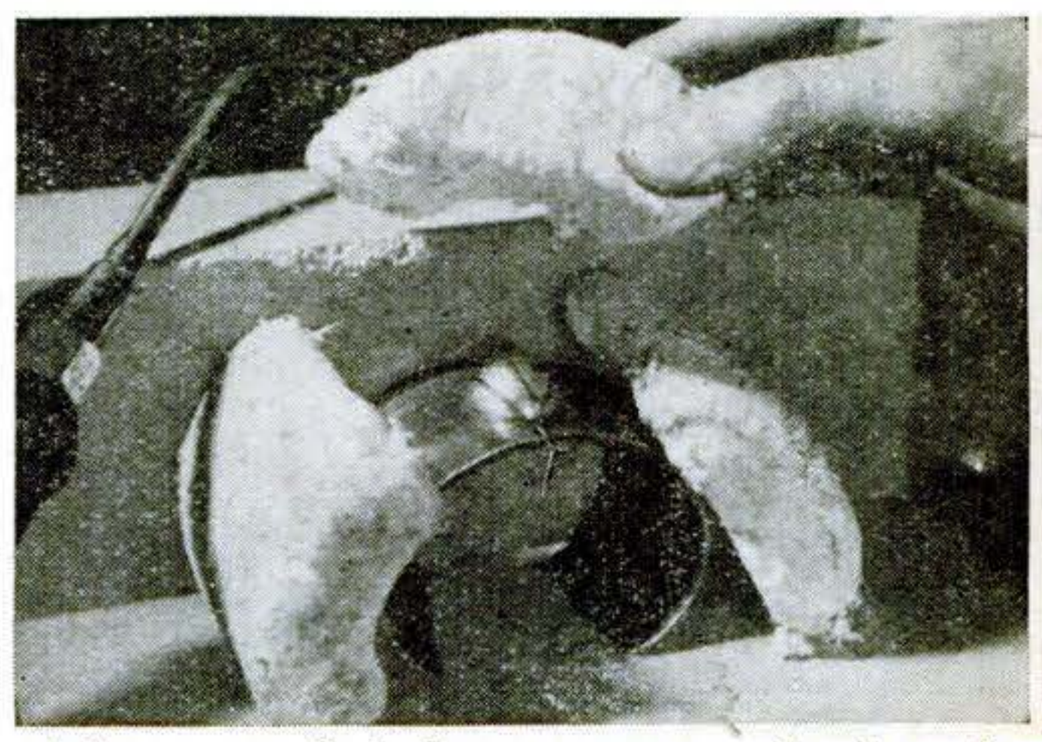
Fine wire twisted around the band and the balls will keep them in place for silver-soldering. Solder one at a time. Soft soldering will do if you use a small torch and work carefully with a minimum of solder. After scraping off any excess, polish the bracelet with progressively finer abrasive cloth. Finish with jeweler's rouge applied with a soft cloth or a clean soft buffing wheel.—W. A. CONWAY.



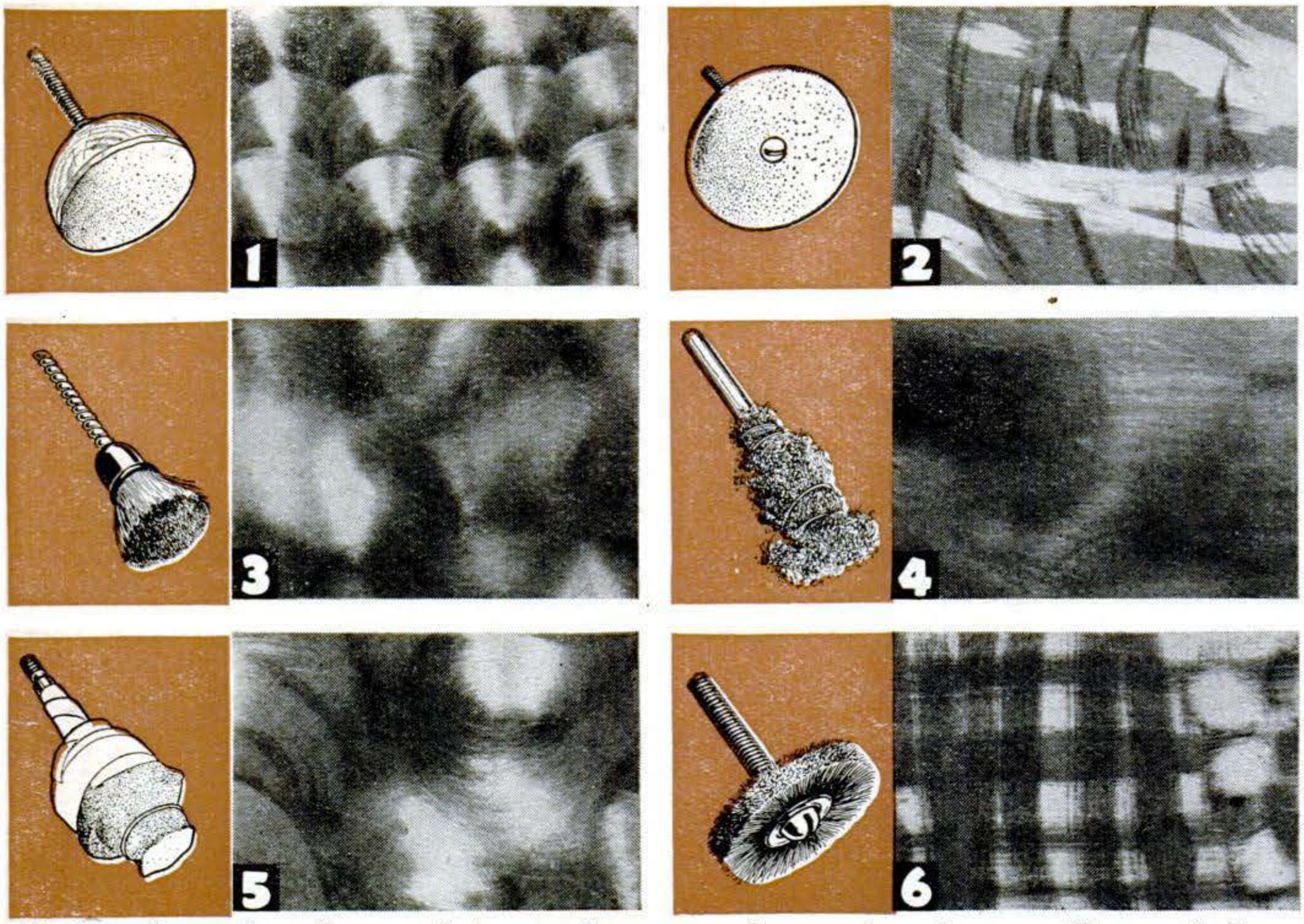
Indent the small circles with a nail punch. A chisel-shaped punch may be used for the lines.



Form the hemispheres with a round-nose punch and dapping die block. Three sizes are needed.



Asbestos pads help to conserve the heat for silver-soldering with a low-temperature alloy.



Various decorative effects and the attachments used to produce them are illustrated above.

Electric Drill Creates Novel Metal Finishes

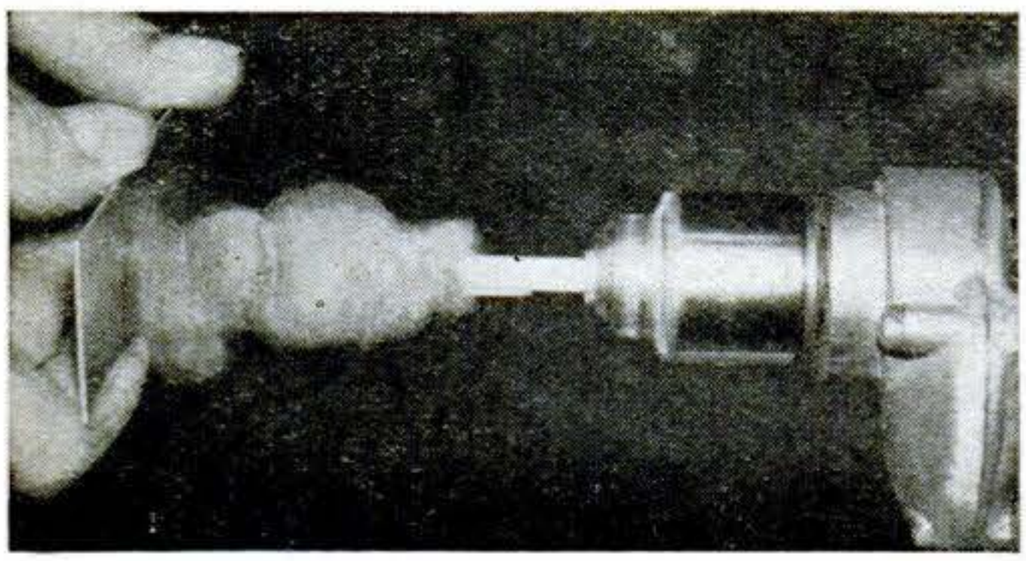
METAL projects or objects already in use in the home may often be improved in appearance by finishing the metal in various effects and patterns. An electric drill or drill press and a few simple accessories are all the equipment needed for such work.

Any soft metal—aluminum, copper, brass, and some alloys—may be given the finishes above by the methods suggested in this article. Harder metals would require tougher abrasives. This is how the decorative effects shown may be produced:

1. An emery pad will yield overlapping circles like these, the pad being applied with even pressure in a regular pattern. Polish with fine steel wool and light oil. The size of the pad determines the size of the circles. Such an attachment may be made by cementing a disk of leather or felt, and then a disk of emery paper, to the end of a wooden dowel section into which you have glued a smaller dowel to fit the chuck of the drill. Or, you might use a bolt that fits the chuck, countersinking its head into the dowel section and then cementing on the disks.

2. An emery disk was applied edgewise here with even pressure. It consists simply of an emery-cloth disk backed with another of cardboard, both clamped by a nut against the head of a bolt that serves as a shank.

3. A brass brush, varying pressure, and



Steel wool mounted on a split-dowel shank in an electric drill decorates soft metal.

Copyrighted material

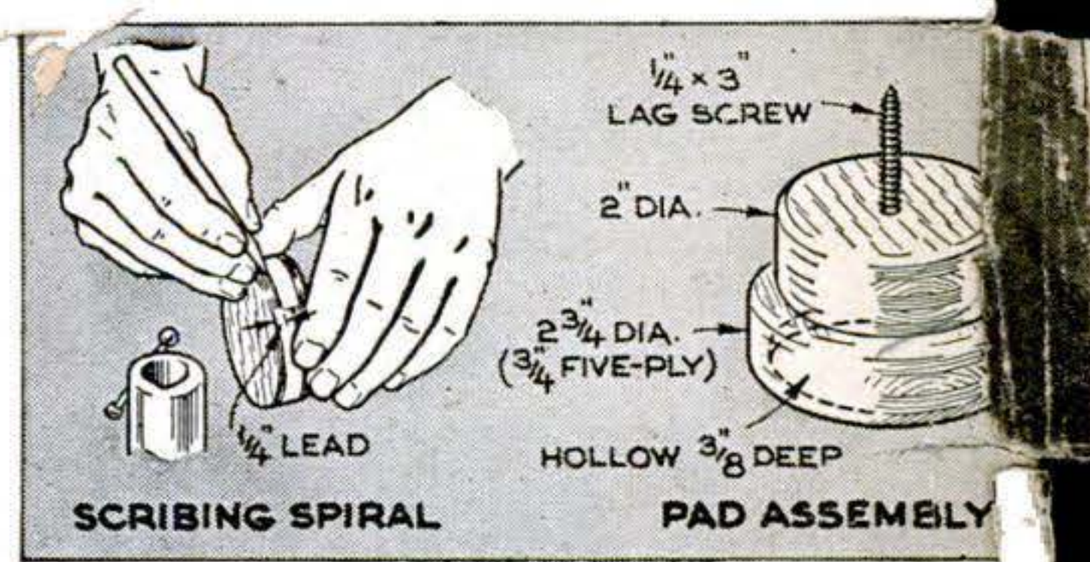
an occasional slide added up to the smoky whirl of these overlapping circles.

4. Drawing the metal back and forth across the end of a steel-wool pad in irregular sweeps gives the effect of graining. Make this pad by turning a dowel to fit the drill chuck, splitting the dowel on one end, and inserting some of the wool in the split before wrapping with soft wire.

5. Here, the edge of an emery roll w applied with heavy pressure in semicircul sweeps. Polish with fine steel wool a light oil. Make the roll by wrapping a taping emery paper over a steel-wool p made as in the foregoing paragraph.

6. An ordinary wire brush offers a variety of good possibilities for straight-line effects.—R. J. DeCristoforo.

Jar Ring Clamps Polishing Pad for Drill Press

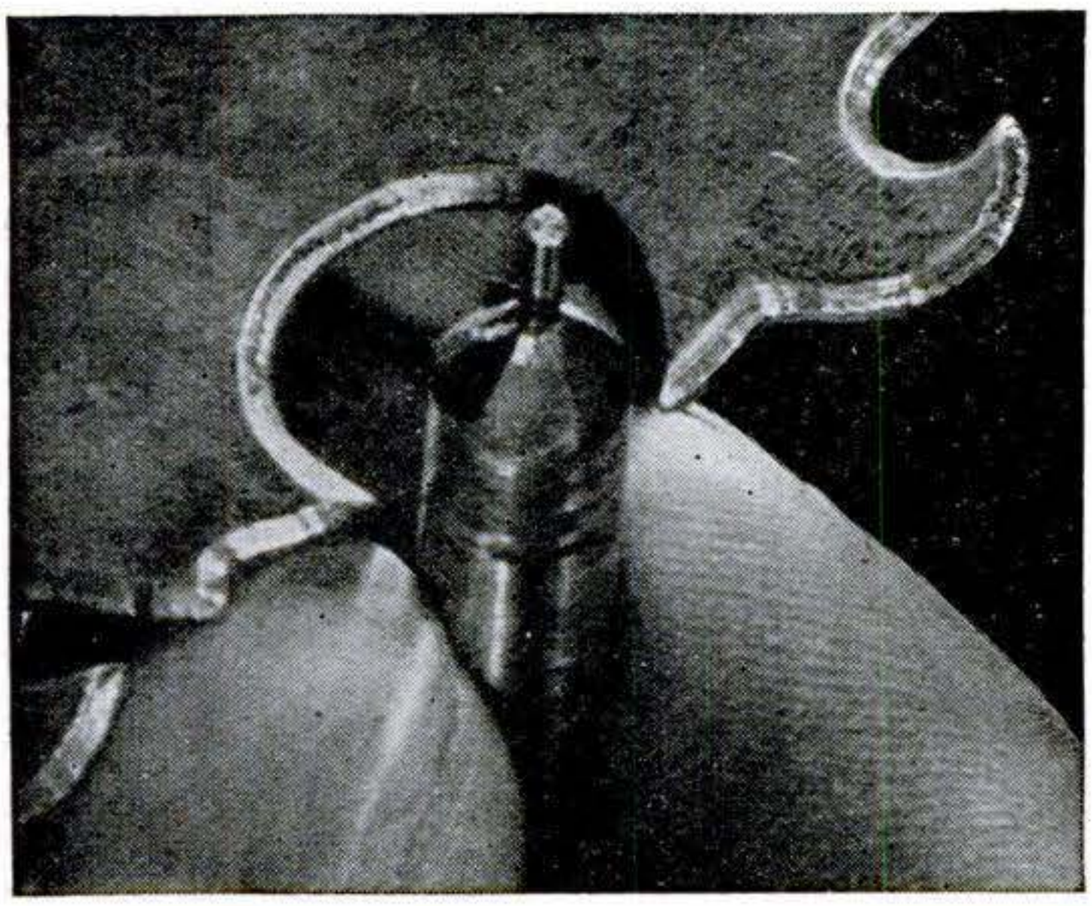


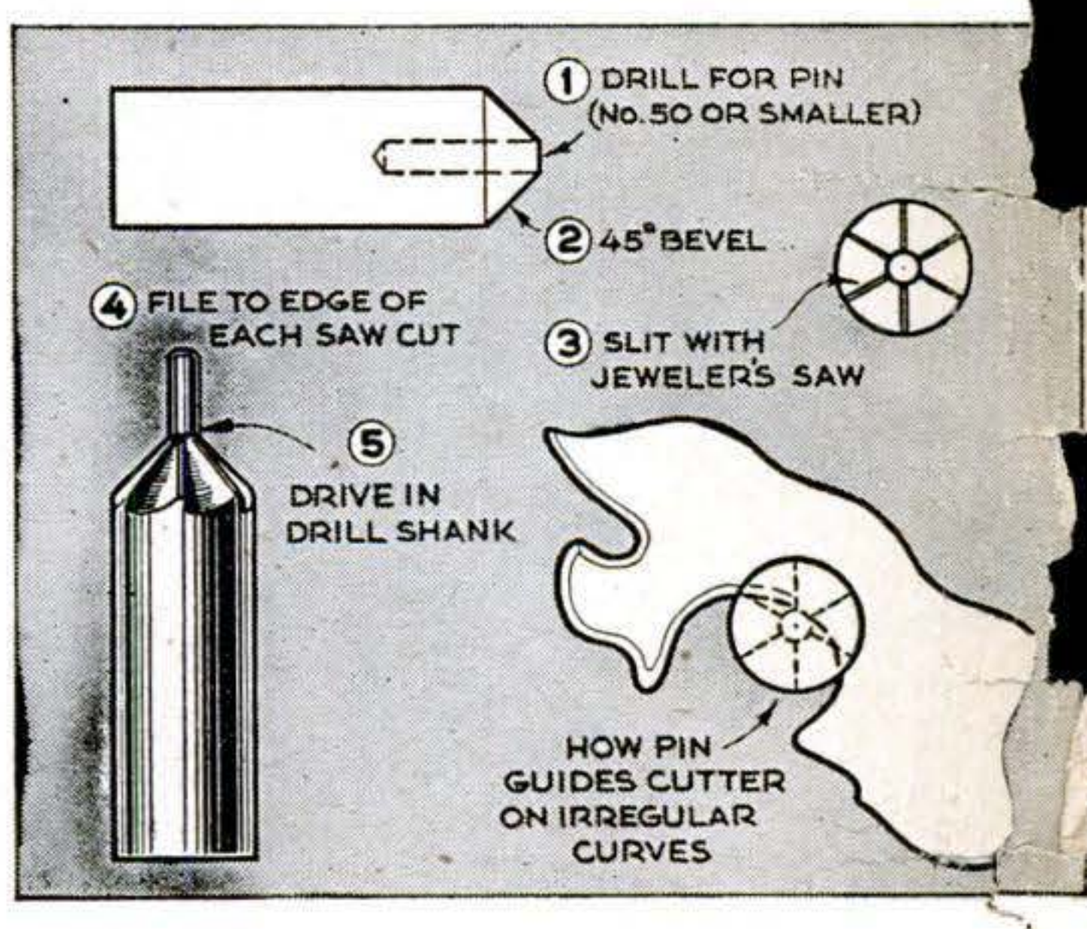
A THREADED jar ring clamps the pad of steel wool used in this efficient polishing head. For the pad assembly, turn two disks from ¾″ plywood, one 2¾″ in diameter and the other 2″. Hollow the face of the larger to allow space for the steel-wool pad.

Scribe a spiral line on the edge of the larger against a strip of cardboard wrapped around it with the ends offset ¼″. Then, with a small gouge, carve a thread suit the jar ring. If the fit proves too loose, d small brads into the thread, allowing th heads to project slightly. A lag screw lock the disks together and serves as a shaf

Form a pad of steel wool with the finger turning the edges under. Place it in ring and screw the ring partly down, tu ing under any loose ends.—Edwin M. Lo

Small Cutter Bevels Edges on Irregular Shapes





Guided by the pin, this drill-press cutter follows an edge on irregular work, beveling as it goes. It was mothered by necessity while I was making brass escutcheon plates.

The cutter may be made from a 1″ length of ¼″ or 5/16″ drill rod. Chuck in the lathe and drill a hole one size smaller than the drill shank you intend to use as the pin. Then turn a 45-deg. bevel, mark off six equal spaces, make slits about 1/32″ deep on these lines with a jeweler's saw, and shape six teeth with a file, sharpening with a fine file. After driving in the pin, harden and temper the cutter.—Herbert Pfister.

Copyrighted material

or a gourmet's touch, add freshly ground pepper to your meals with this table pepper mill.

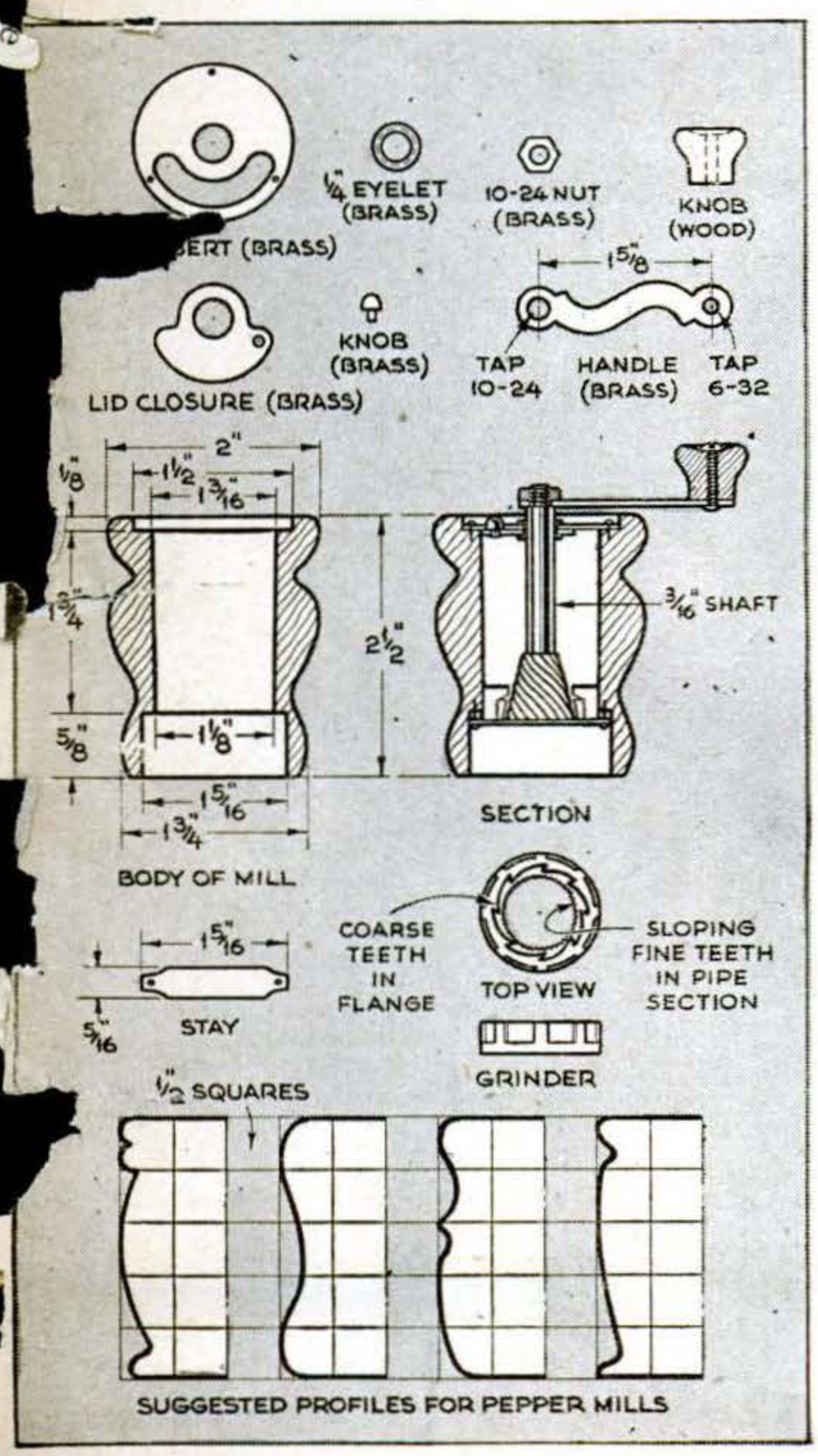


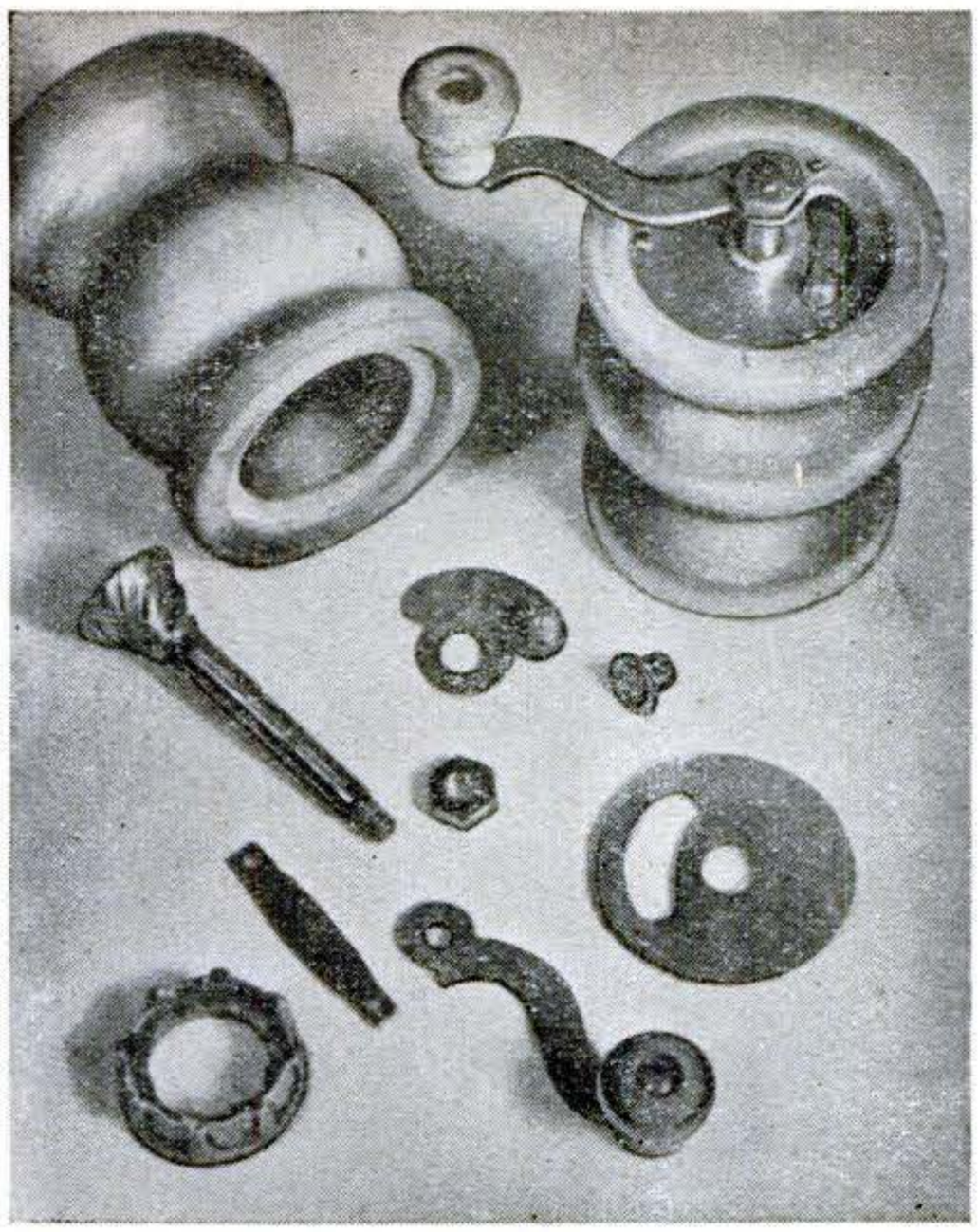
Table Mill Grinds Fresh Pepper

PEPPERCORNS, the hard little seeds from which fresh, pungent pepper is obtained, can be ground directly over your plate with this traditional table mill.

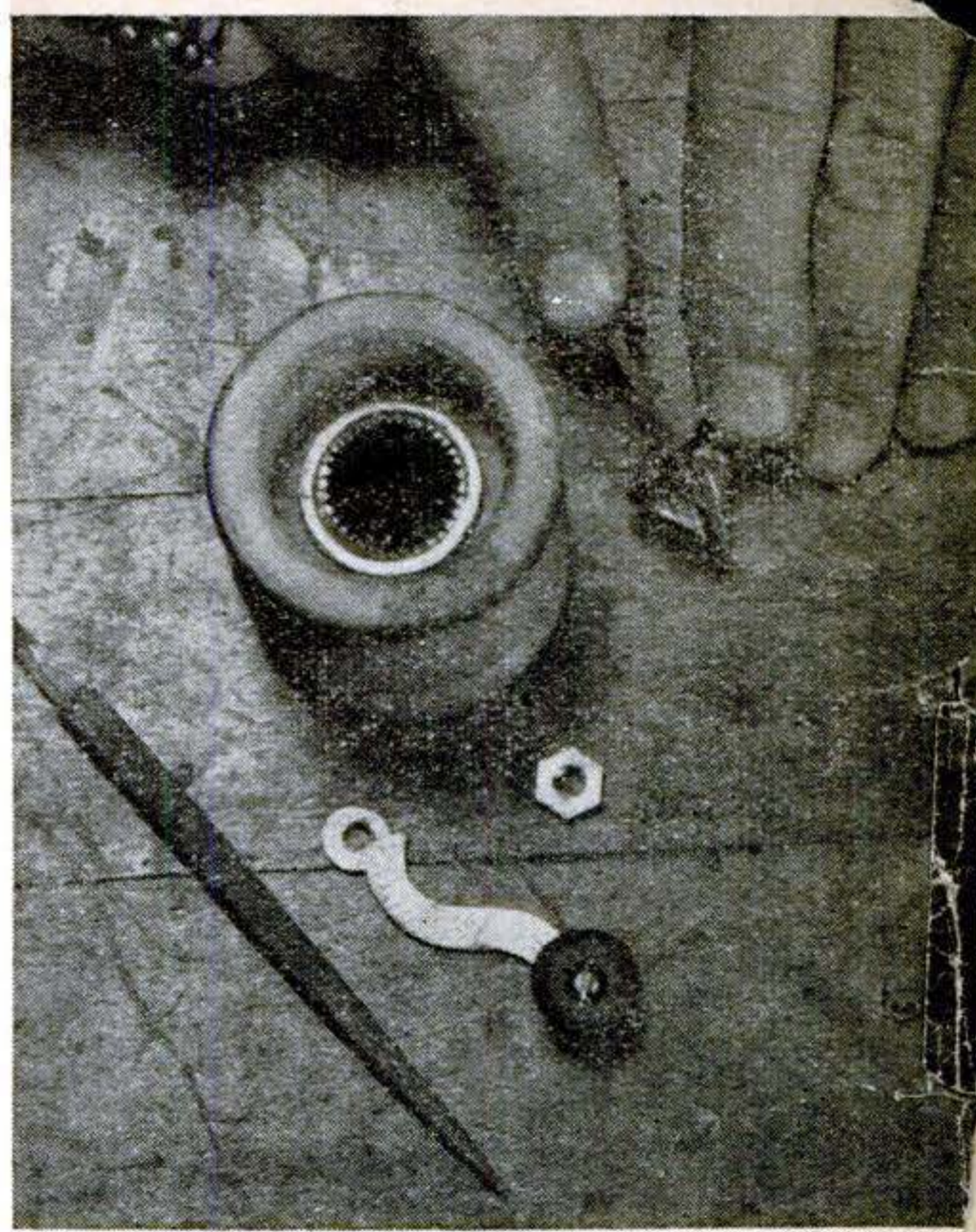
Mount a 2¼″ maple turning square on the screw center, support it with the dead center, and rough-turn the outside. Turn out the 1½″ top recess. Then slide away the tailstock and carefully bore out to 1 3/16″ diameter about 1½″ deep. Now mount a bit of scrap and turn it as a tight-fitting mandrel for the 1 3/16″ bore. Mount the reversed workpiece on this mandrel, bore through a press fit for the grinder, turn the lower recess, and finish-turn the outside.

File the lid insert, the closure, and the eyelet from light brass, but use heavier brass for the handle. The knob for the closure is simply a brass nubbin riveted in place. For the shaft, use a 2 ⅜″ length of 3/16″ steel rod (solid curtain rod is often found in this size). Thread the upper end 10-24 for ¼″, and the lower 10-24 for 11/16″.

Copyrighted material



All metal parts are filed to shape. A conduit bushing, lower left, is used for the grinder.

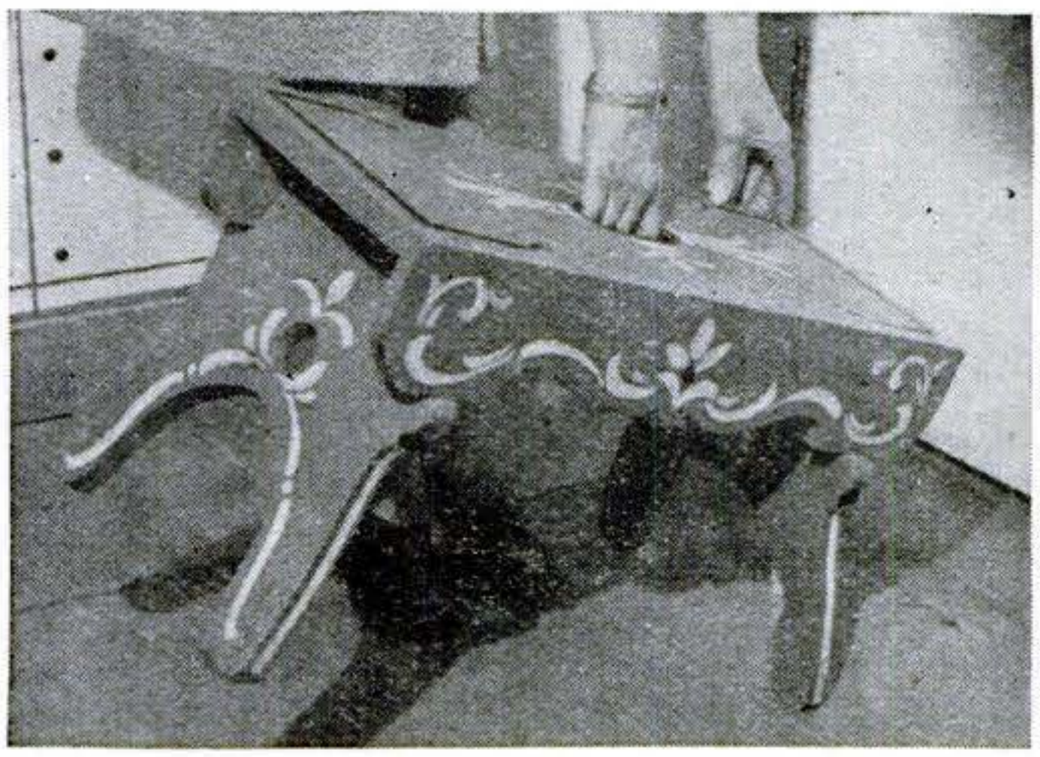


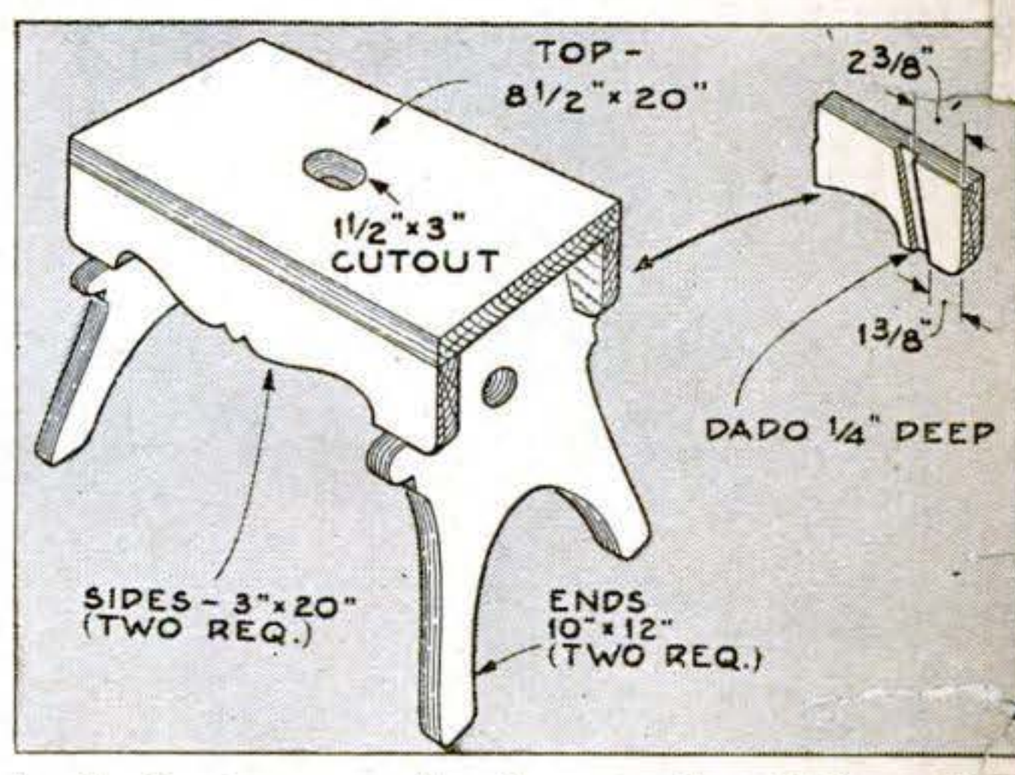
File spiral teeth in the grinder head with triangular file. Fit the wood knob to turn easily.

Turn the grinder head from a ⅝″ length of ¾″ steel, tapering it from 11/16″ to 5/16″. Drill and tap it 10-24, screw it on the shaft, and peen the latter over. File spiral flutings around the head.

For the grinder, screw a piece of ½″ pipe into an electrical-conduit bushing and cut off the pipe flush. Around the lip of the bushing file saw-shaped teeth. Inside the pipe, file many small teeth at an angle slightly less than the head taper. Press the grinder carefully into the barrel, tack the lid assembly to its shoulder with escutcheon pins, and insert the shaft and grinder head from beneath, securing it with a stay tacked across the bottom.—Paul Aller.

Sturdy Footstool Will Bring You Solid Comfort





Sturdy and decorative, this stool offers an excellent one-evening project. If necessary, it may be built entirely with hand tools. All pieces are cut from 1″ stock.

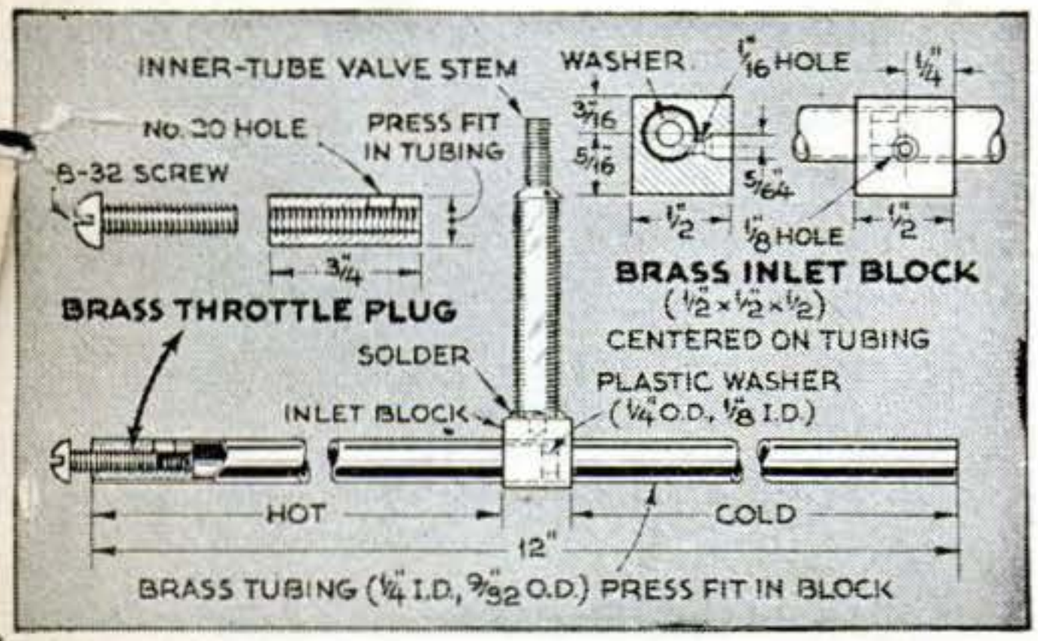
Shape the two endpieces to the freehand curves shown with a coping saw, making them about 12″ long. Since these are attached at an angle, the stool will be a bit less than 12″ high when assembled. Slanted dadoes cut in the sidepieces bring the feet about 22″ apart at the bottom.

Assemble all the pieces by gluing and nailing. When the glue has set, decorate by painting as desired.—Edward R. Lucas.

Copyrighted material

The left arm of this model of the mysterious Hilsch tube gets hot. The right arm grows cold.

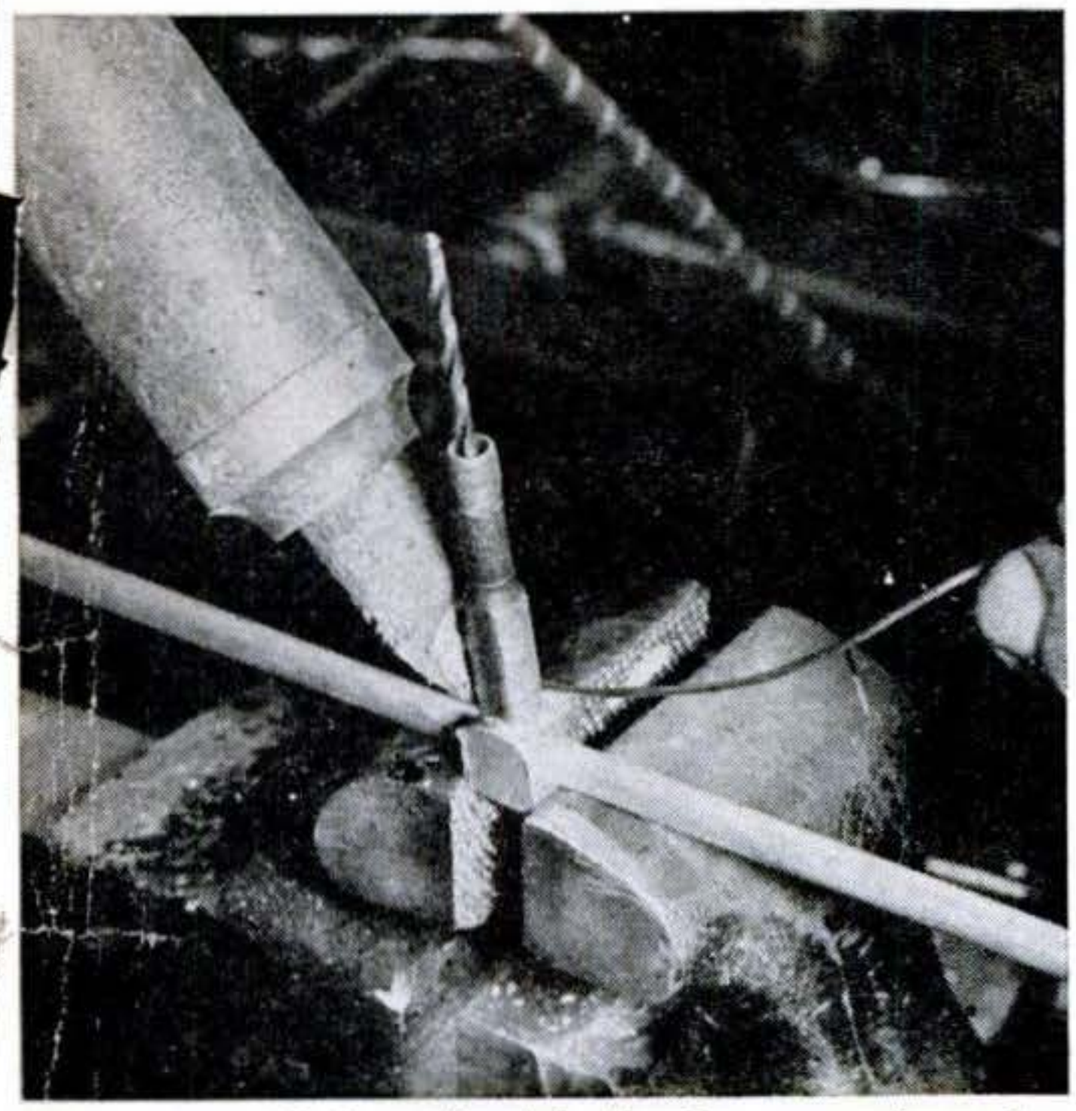
Homemade "Maxwell's Demon" Blows Hot and Cold



THE magic Hilsch tube that imitates Maxwell's imaginary demon by blowing hot and cold at the same time (PSM, May '47, p. 144) can be made at your own workbench and operated at the nearest gas station. A simplified version was designed for Popular Science readers at the RCA Transmitter Laboratory, Rocky Point, N. Y., where research on this curiosity of thermodynamics goes on.

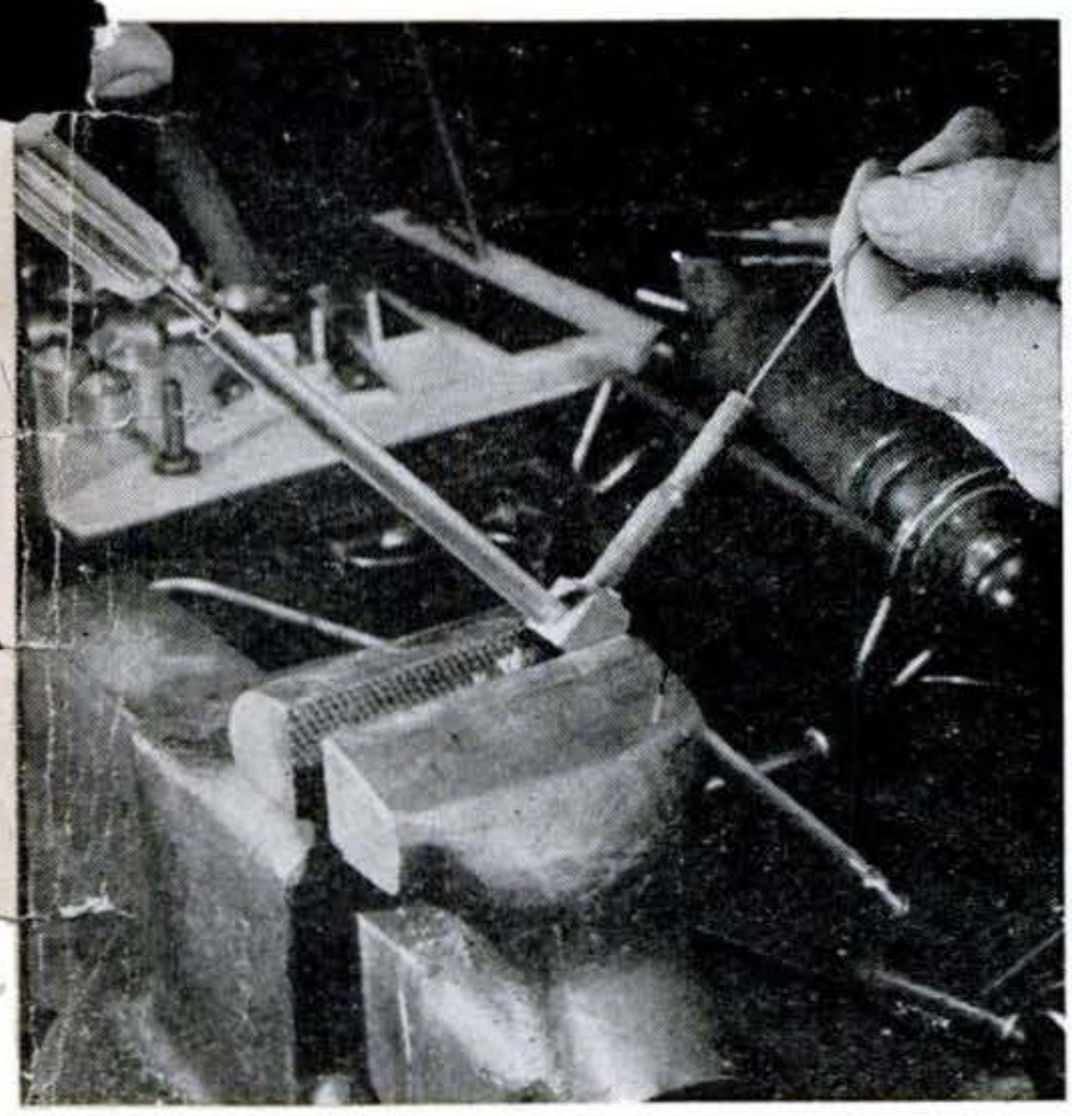
PSM's Hilsch tube was made in a few

Copyrighted material

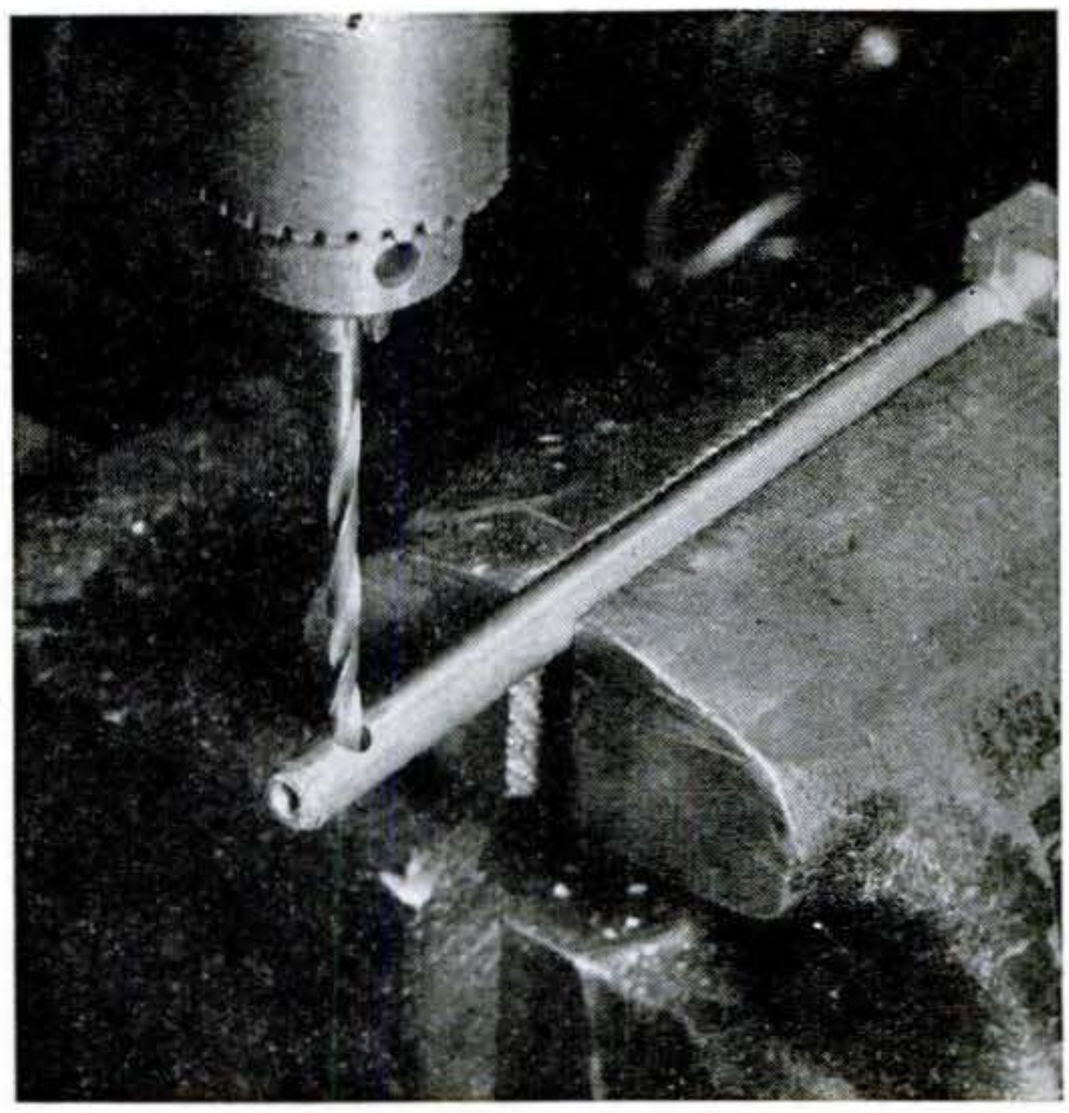


Now saw off the inlet block. Remove the valve from an inner-tube stem and cut off the base. Push a 1/16" drill through to align it with the inlet hole and solder all around as above.

A plastic or wood washer (not metal) that will be a push fit in the tube is needed. The hole in it is about ⅛". Make the washer, if necessary, from a dowel or slice it off a tube.



Insert the washer in the tube, marking the end from which you do so. This will be the cold arm. Stick a 1/16" rod through the inlet and push the washer against the rod as above.



Cut a piece ¾" long off some ¼" brass rod. Drill through lengthwise No. 28 and tap 8-32. Press this into the hot end of the tube. Drill a No. 20 hole right through both tube and rod.

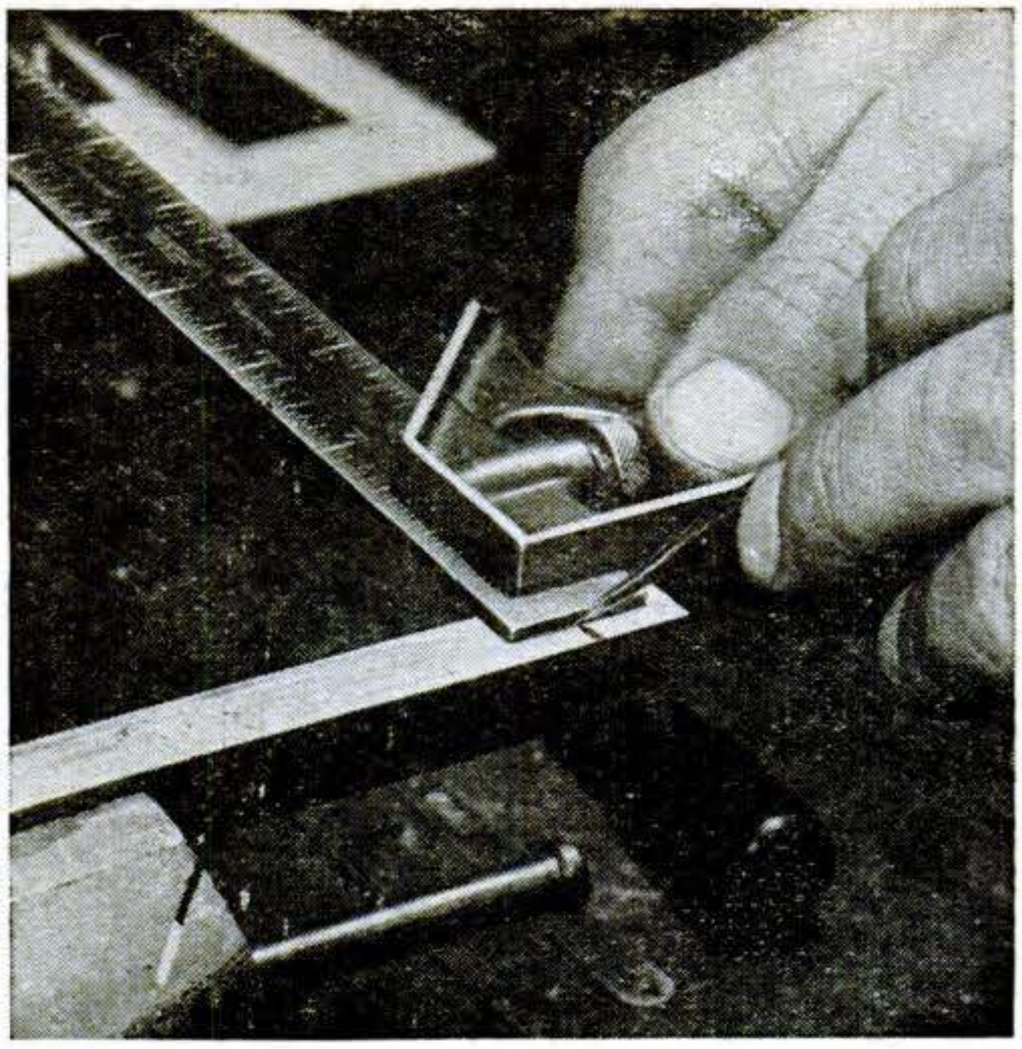
the cooling effect, would be automatically controlled by air speed and density, increasing as skin friction goes up, decreasing as it lessens.

Although most of the dimensions shown in the drawing aren't critical, the location of the air inlet must be tangent to the inner wall of the tube to set up the whirlpool effect necessary to operation. The 1/16" inlet hole must be drilled just far enough to break smoothly into the tube, but not so far as to nick the adjacent part of the wall. This might destroy the vortex effect desired.

If you can't find a suitable fiber washer or cut one off a fiber or plastic tube, drill a ⅛" hole in a slice of ¼" wooden dowel.

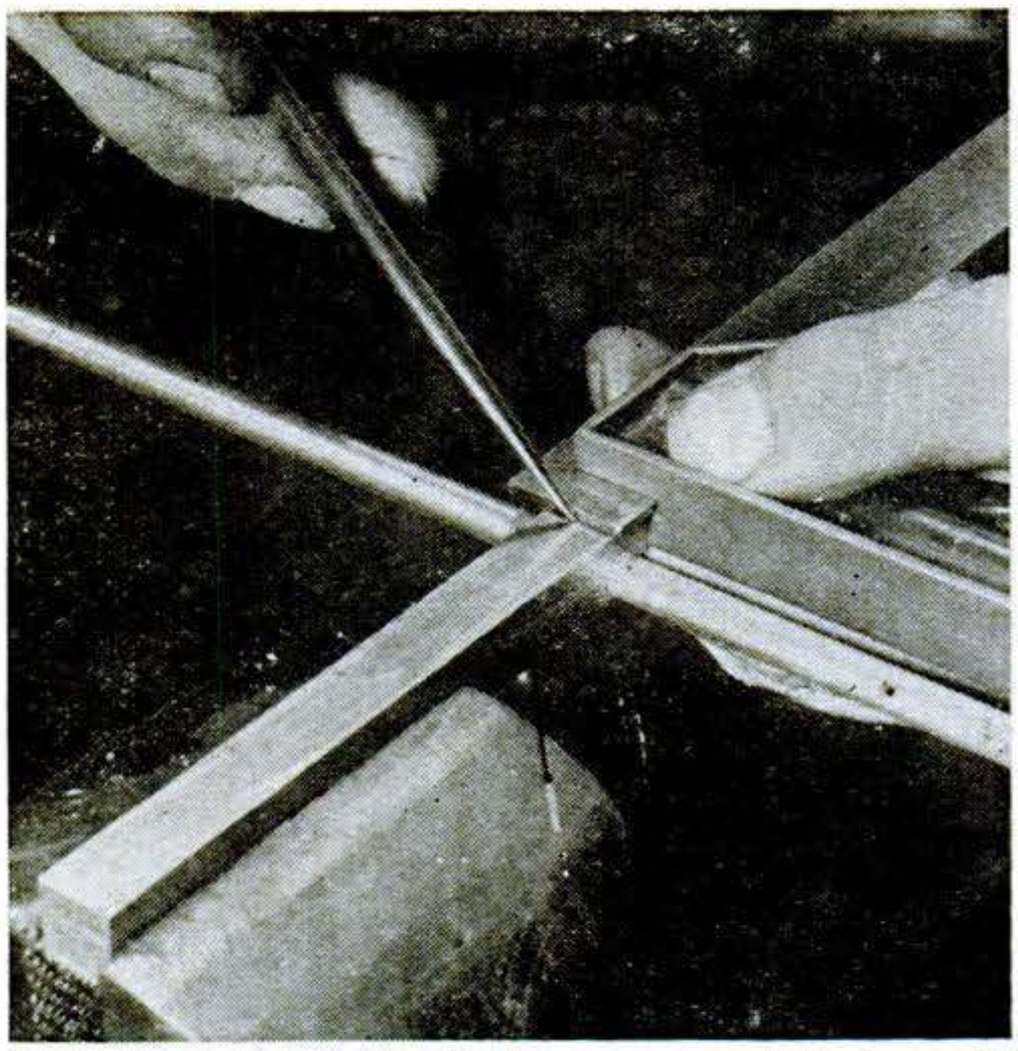
The throttle is a short length of ¼" rod tapped for the throttle screw. It's inserted in the hot end of the tube without the screw, and a No. 20 drill is run right through both tube and throttle. If it's too loose a fit in the tube, coat it thinly with solder. END

Copyrighted material

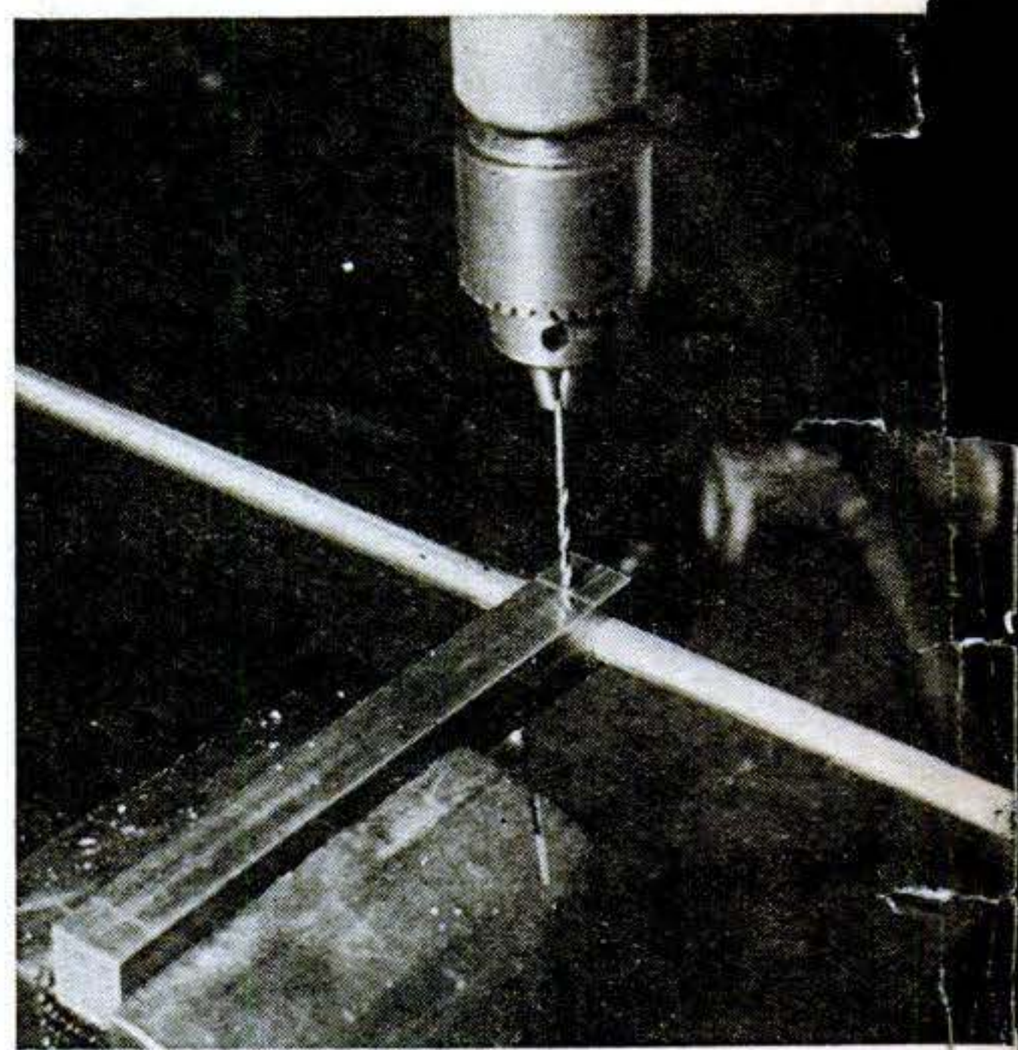


Mark the location of the 12" long tube on the ½" square brass stock from which the inlet block will be cut. At this point drill a hole that will be a press fit for 9/32" tubing.

Carefully drive the tube through the hole so that the two arms are approximately the same length on both sides of the inlet block. However, don't cut the block off as yet.



Locating the inlet hole is a crucial step. It must be tangent to the inner wall of the tube, 5/64" from the center of the first hole, to create the necessary whirlpool effect.

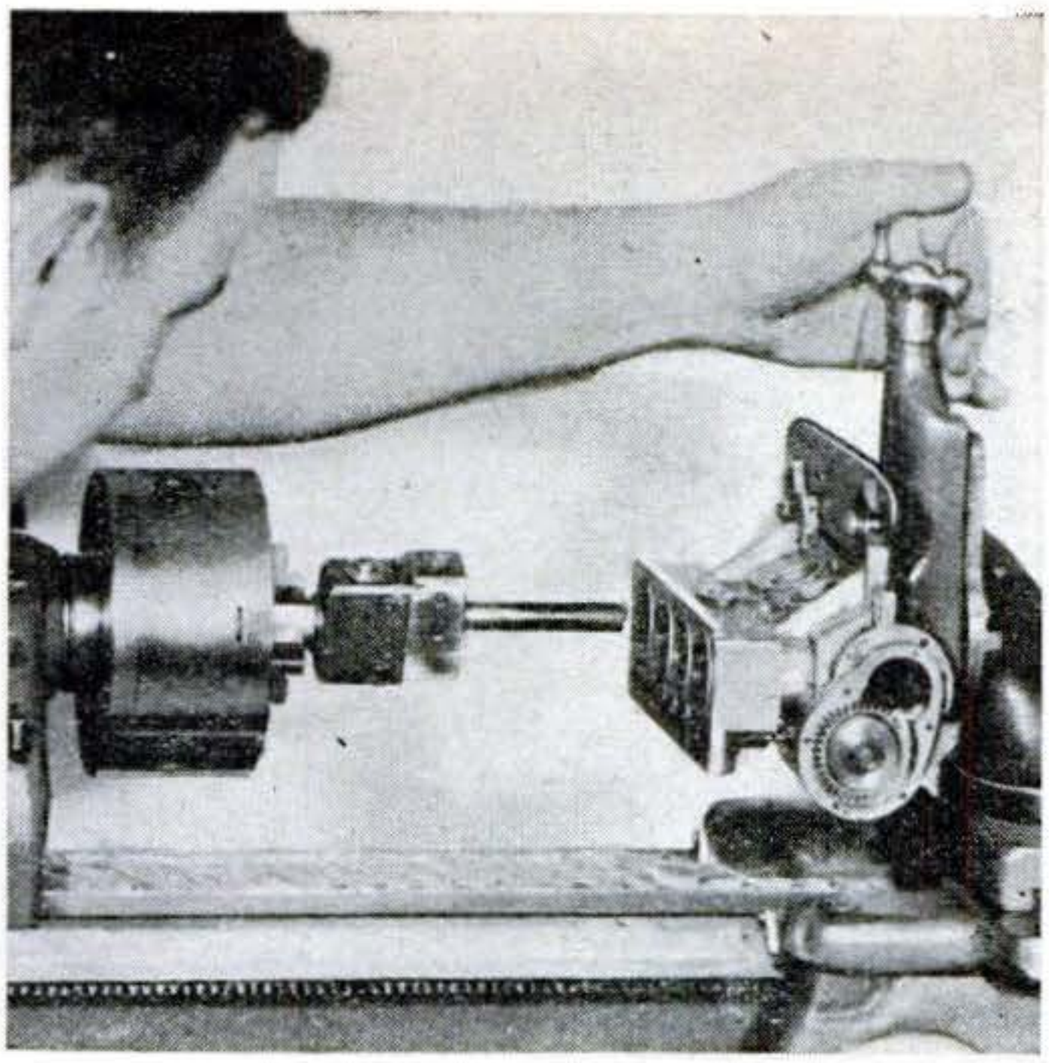


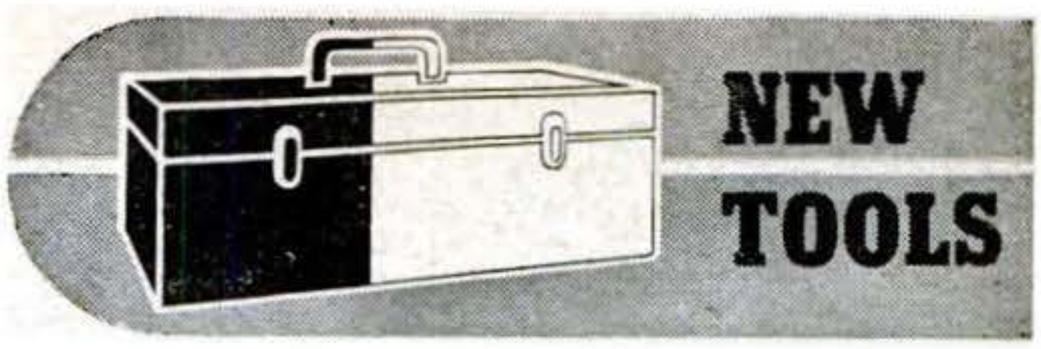
Drill a 1/16" hole straight down, but only just through the tube wall. Drilling across the tube may cause it not to work. Counterbore the inlet hole ⅛" to about half its depth.

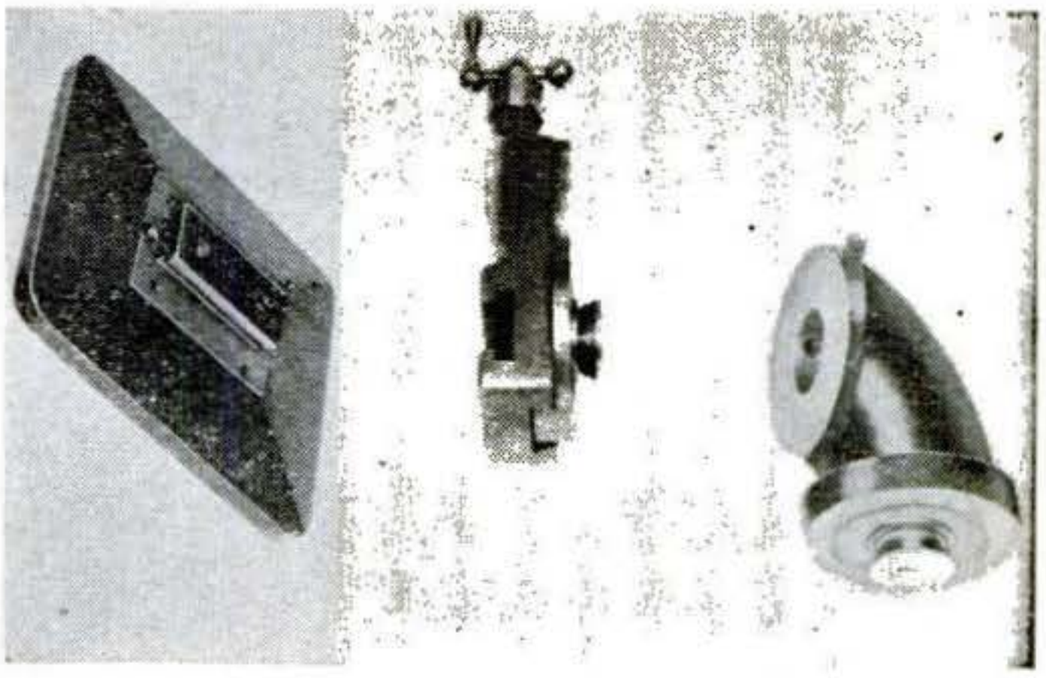
minutes with simple tools. When it was hooked to a filling-station air hose, one arm became too hot to touch, while the other gathered frost. Connect your Hilsch tube to an air line having between 75 and 100 lb. pressure. With the throttle wide open, both arms will be at the same temperature. Close the throttle about half way, and the cold arm reaches its lowest temperature. Close it almost entirely, and the hot arm reaches its highest temperature.

What makes it work? Physicists can agree on an answer, even though the inventor, Dr. Rudolph Hilsch, of Erlangen Germany, has published his own explanation. But some practical applications have been suggested. C. W. Hansell, RCA engineer, thinks it might cool the cabins of supersonic planes, combating the tremendous heat generated by skin friction at high speeds. Since the inlet could be located on a leading wing edge, pressure, and therefore

Copyrighted material





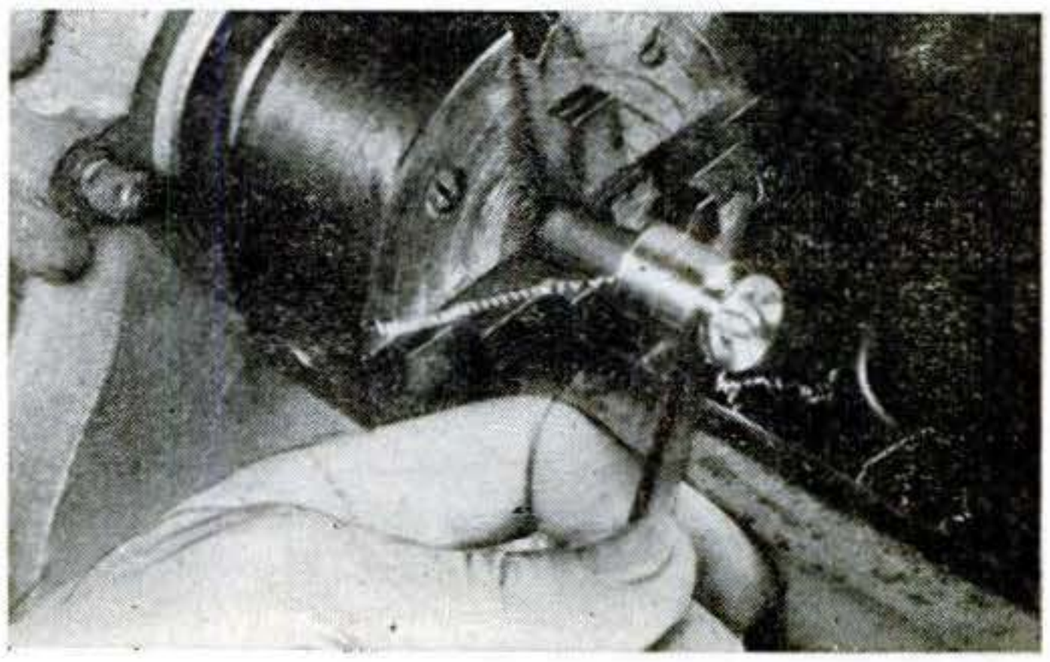


Milling on a Lathe. Precision boring and milling can be performed on virtually any small machine lathe with a new adapter being manufactured by the Qualified Gage Company, of Berkley, Mich. Providing for both horizontal and vertical movement of the work, the adapter consists of two main parts. One is a 90-deg. elbow mounted on the cross slide in place of the compound, the latter being attached to the end of the elbow in a vertical position. A faceplate, the second part of the adapter, goes on the compound to hold the work. Adapters are available for virtually all popular lathes.

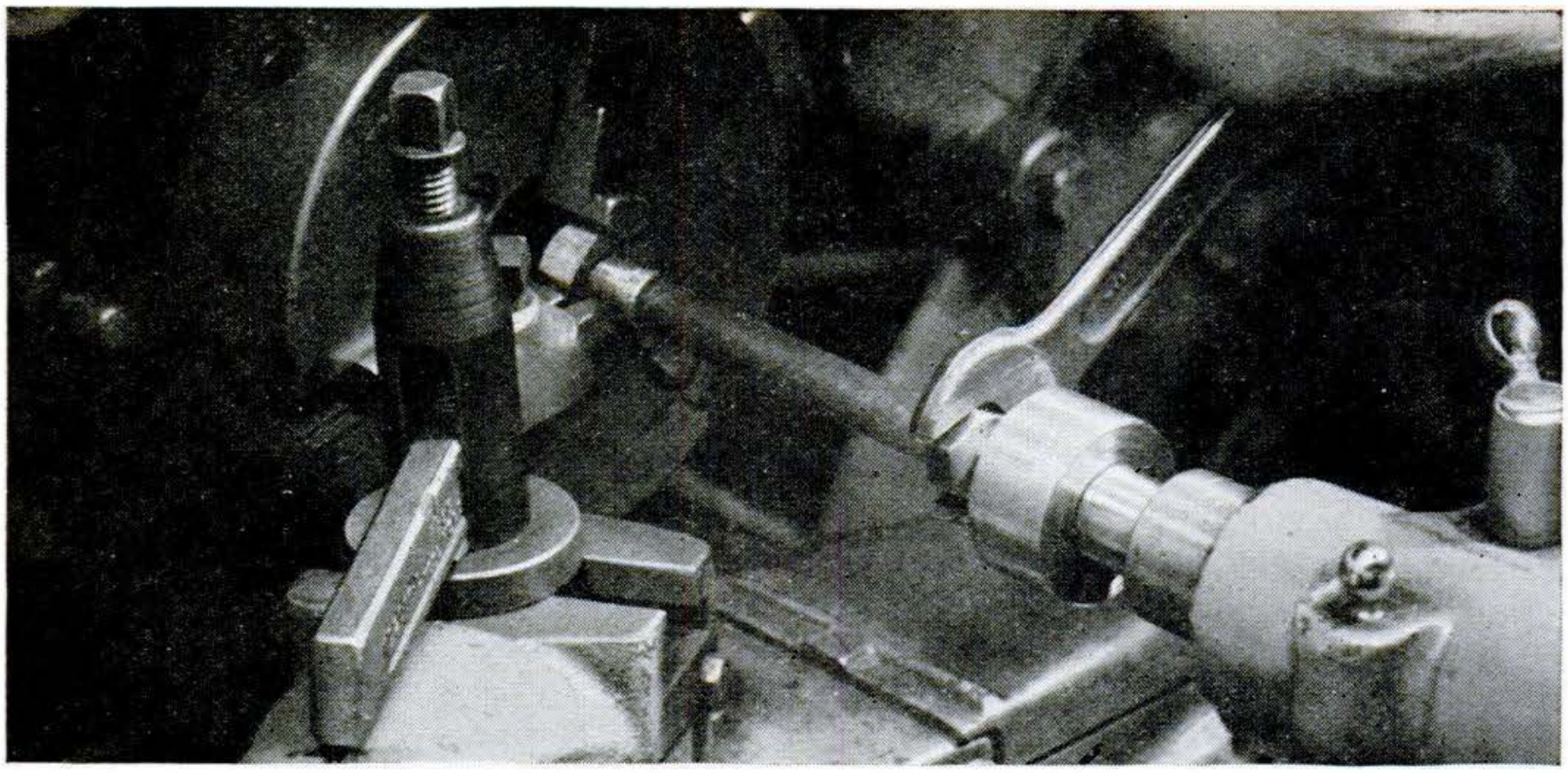
Blowtorch. Dry chemical fuel in tablet form is used in a small blowtorch made by the Birk Manufacturing Company, of East Hartford, Conn. Operated by blowing through a flexible plastic tube, the torch is said to be suitable for soft or silver soldering, light brazing, annealing, or hardening of small work. Tests indicate the torch produces temperatures above 2,000 deg. F.

Collet Chuck. Small drills may be accurately centered with an adjustable collet chuck made by the Chicago-Latrobe Twist Drill Works, the adjustments being made with three screws. It is available with collets of two sizes—the smaller for diameters of .005″ to .025″ and the other for diameters of .020″ to .040″. The chuck is priced at about $20, the collets at $6 each.

Metal Turned Freehand. Lathe chisels with tungsten carbide tips now on the market make it possible to turn soft metals freehand on a wood lathe. They can also be used, of course, for turning plastics and wood. Martin, Inc., of Milwaukee, Wis., offers square and roundnose chisels of this type in ⅛″ and ¼″ sizes. The Johns Manufacturing Corp., of Dunellen, N. J., makes them in four sizes—⅛″, ¼″, ⅜″, and ½″. The tips seldom require honing.



Copyrighted material

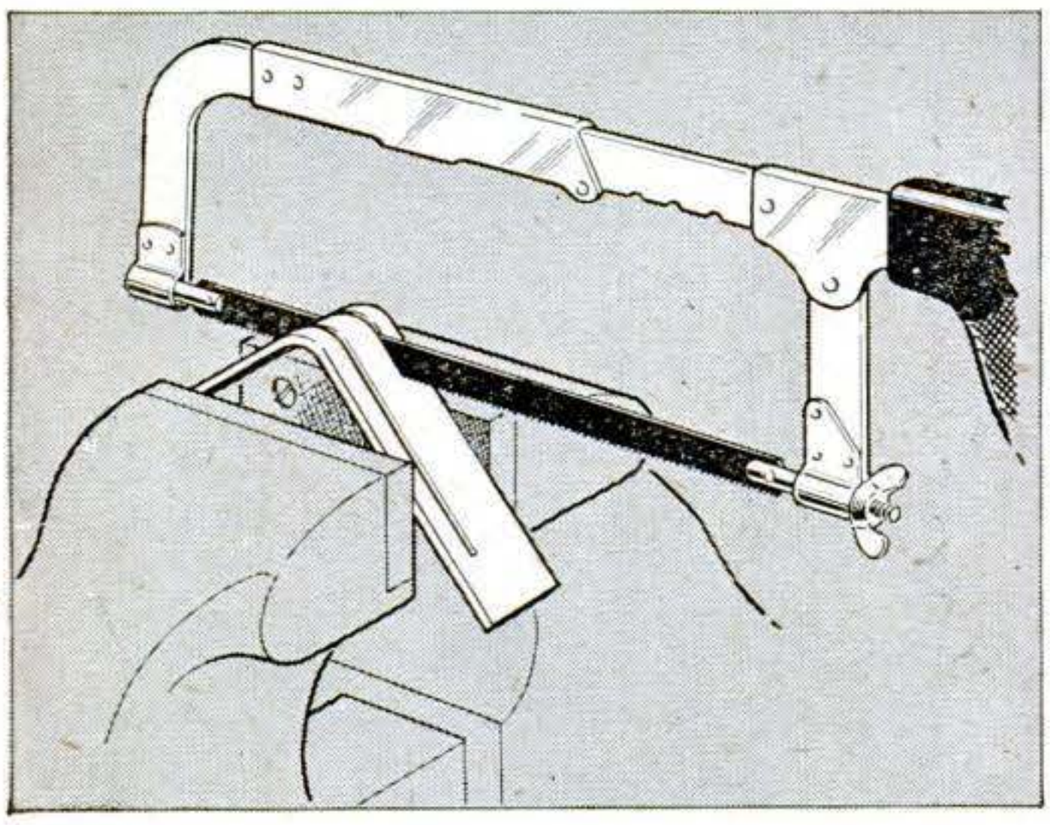


Bolt Threads Extended. When the threads on a bolt are not long enough, you can extend them with the lathe setup shown. Any lathe with a slide rest will do; no screw-cutting gears are needed.

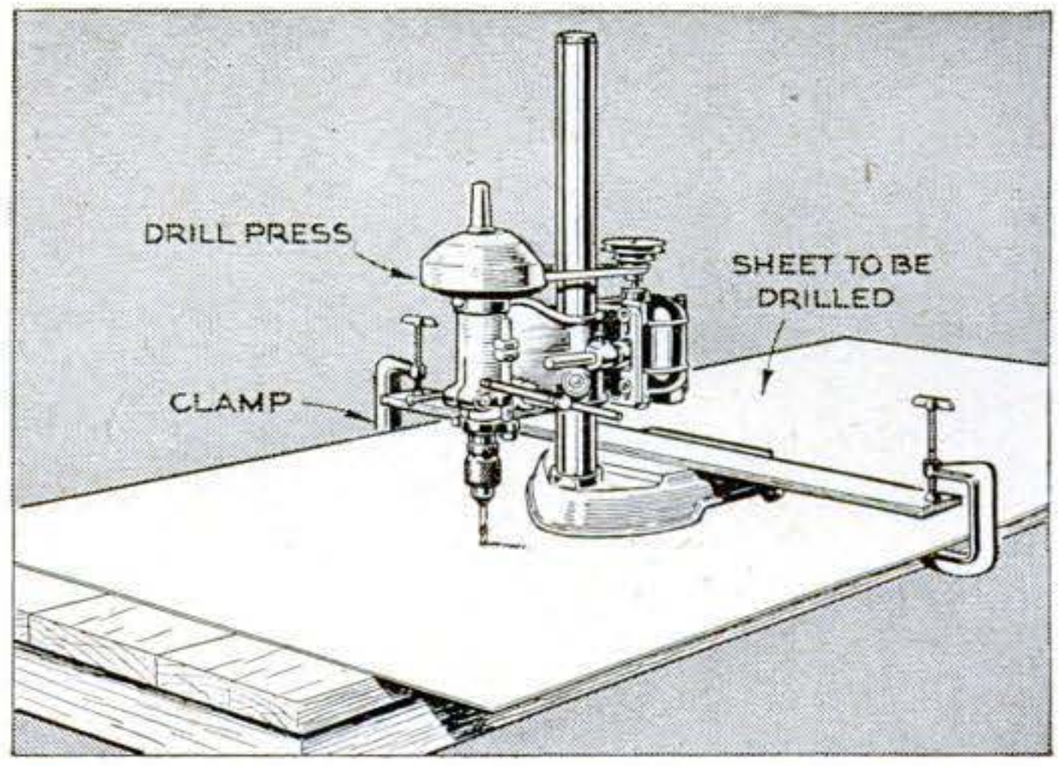
Centerdrill the bolthead and clamp a nut that fits the bolt in the three-jaw chuck. Lock the spindle with the head-stock indexing pin, the back gears, or otherwise. Turn the bolt into the nut and run the tailstock center up so as to support the bolthead.

Mount a turning bit with a 60-deg. point upside down in the tool post as above, its point slightly below center height, and turn the slide rest to bring it firmly into a full thread on the bolt. Then turn the bolt slowly into the nut with a wrench, constantly advancing the tailstock center to support the head. If the bolt is tough or has a very coarse thread, make several light cuts.

NEW SHOP IDEAS

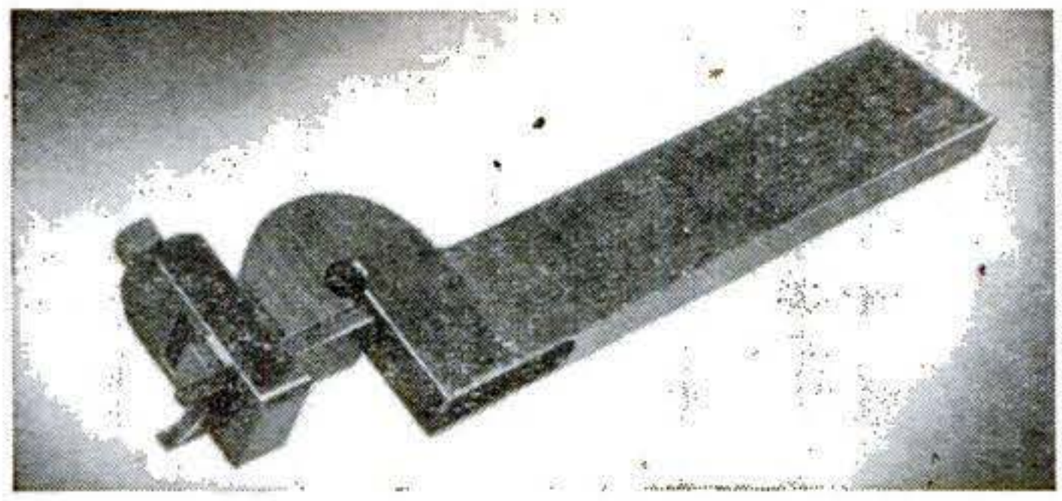


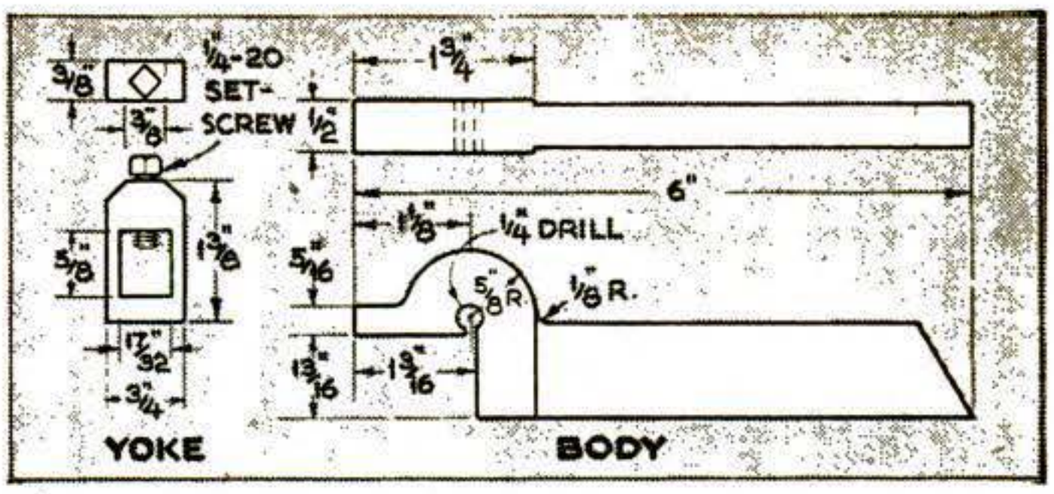
Cutting a Blind Slot. Where no great precision is called for and the work will tolerate bending, slots can be cut much faster with a hacksaw than by drilling and filing. Simply bend the piece as above. To remove the waste strip, use a chisel or drill a hole at each end.—H. SCHMIDBAUER.



Press Capacity Multiplied. Having to drill numerous holes in a large steel plate, at points far beyond the capacity of my drill press to reach, I made use of the arrangement shown above. The sheet was laid on a sturdy bench and the drill press clamped on top of it by a heavy batten that reached over the edges. Then the head of the press was turned 180 deg. and tightened low down on the column. Of course the machine had to be reclamped for each hole. Although the drawing shows the regular table removed from the column, this may not always be necessary.—R. L. MACLEAN.

Copyrighted material

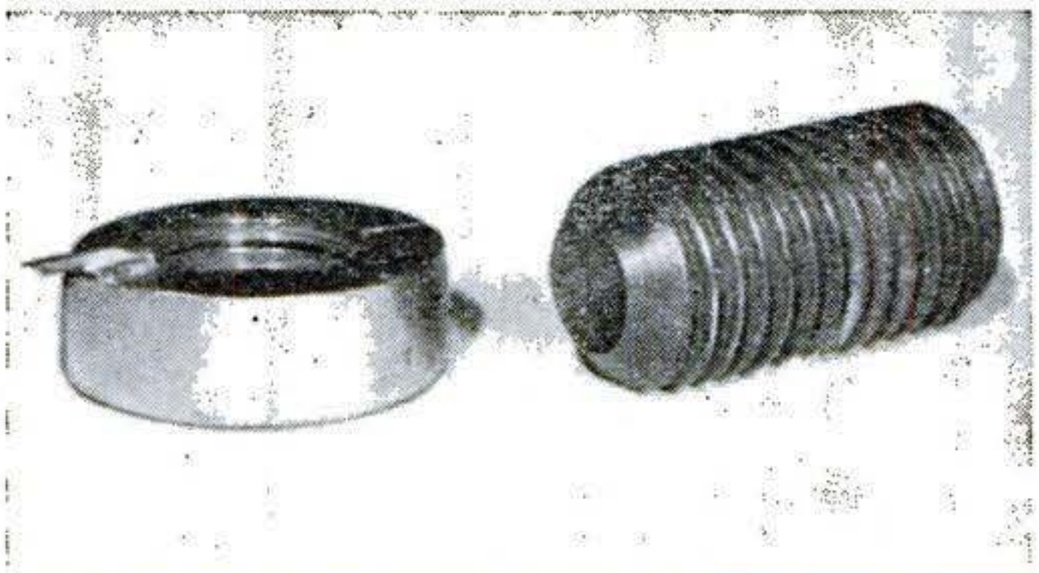


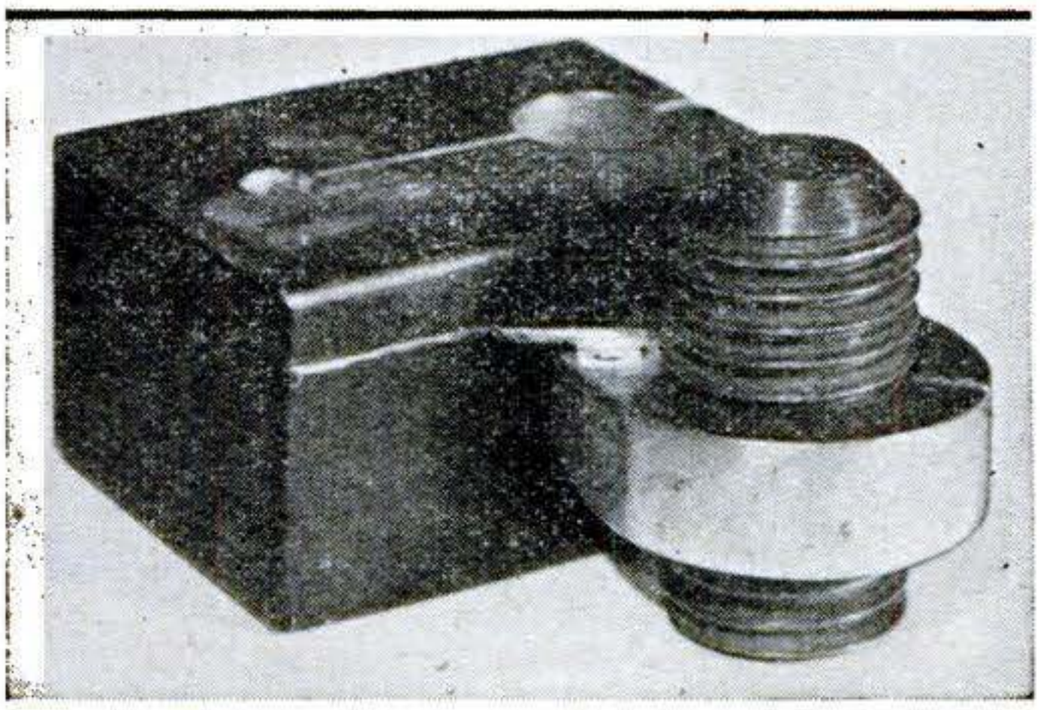


Spring Tool Cuts Chatter. Forming tools cut smoothly without chatter in this spring holder. It will also serve as a right-hand, left-hand, or straight holder for threading or turning bits up to 5/16" square.

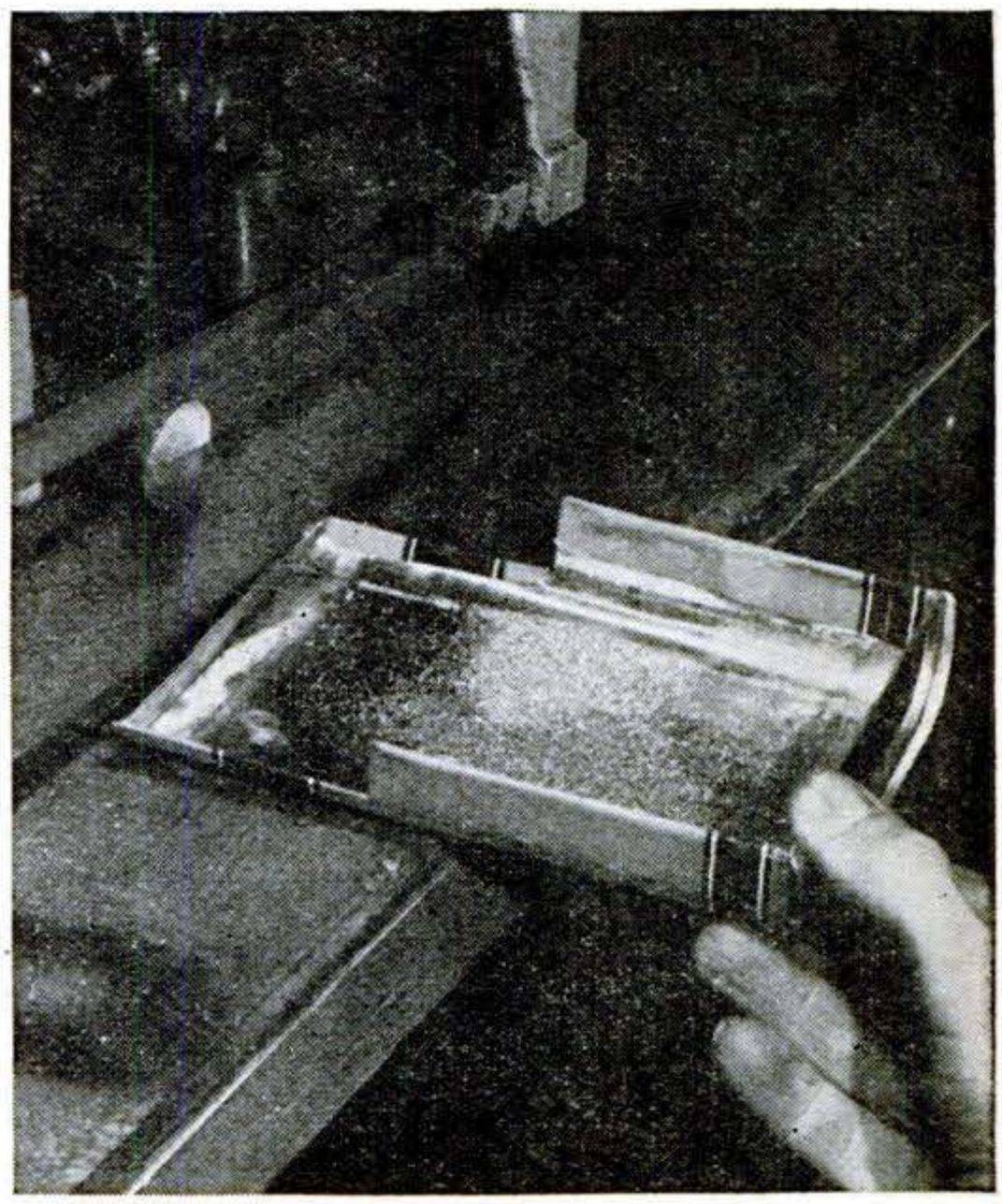
Tool steel is best for both parts, although cold-rolled may be used for the body. The yoke should be of tool steel if at all possible, as it takes considerable strain. I milled it out with a 3/16" end mill, squared up the corners with a file, and then hardened it, tempering to a light straw color. The hardened square-head setscrew was purchased.

I finished the shank on a shaper and the curved top on a filing machine, but the job can be done by freehand grinding and filing. The distance from the bottom of the shank to the underside of the overhanging tongue is critical. Although 13/16" on the holder shown, this should be such as to bring the bottom of the tongue exactly to lathe center height. With the shank horizontal in the tool post, tool cutting edges should come exactly to the center height on your particular lathe.—C. M. Chambers.





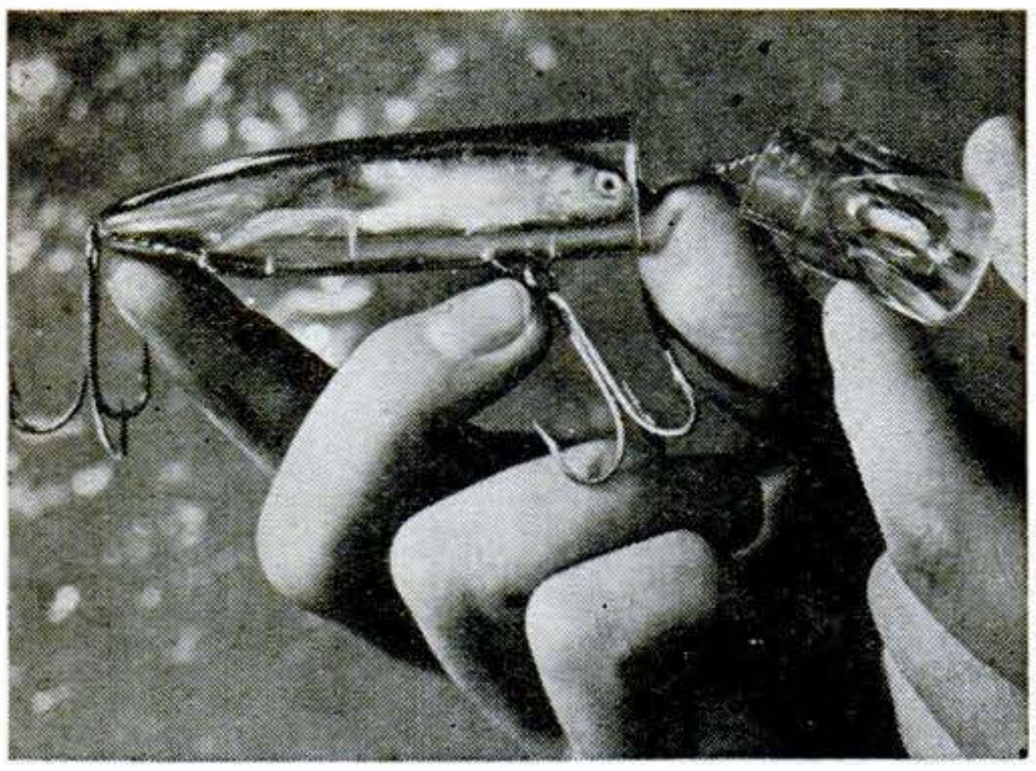
Five-Minute Surface Gauge. You can make this handy tool in a hurry from a headless setscrew or stud ½" or more in diameter and 1½" long, a nut, and a bit of steel wire or a phonograph needle. Be sure the end of the screw is square; the finer its threads, the better. Hacksaw a slot in the nut and squeeze it together to fit snugly on the threads. Then solder the wire or needle scriber on as shown above. A piece of plate glass makes a good surface plate for use with the gauge.—R. Brisco.



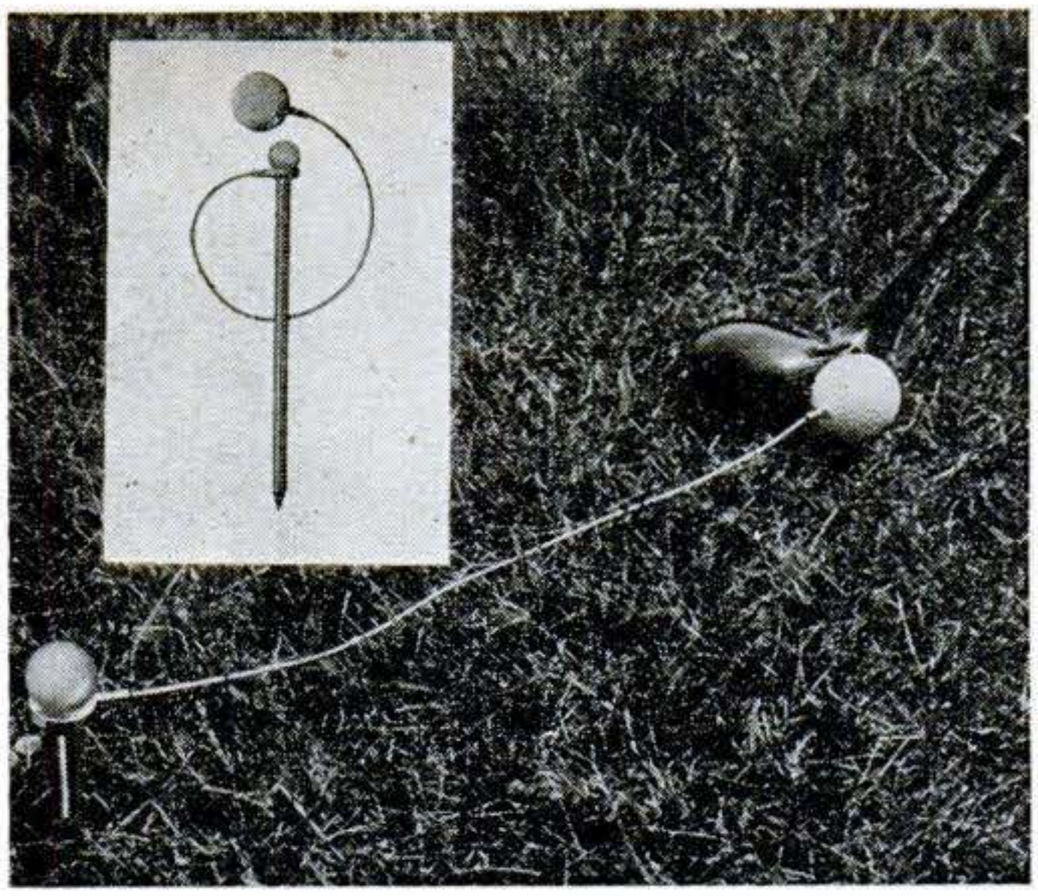
Tray Catches Saw Chips. Metal particles produced by a power hacksaw are easier to clean up if a tray is provided beneath the work to catch them. The one shown above was made from a flat can that had contained fire-extinguisher fluid. An entire side and part of each end were cut away, and the cut metal was folded over to form safe edges. The low part of the tray slides under the saw frame, which positions the tray to catch most of the chips. It is easily removed when full.—W. E. Burton.

Copyrighted material

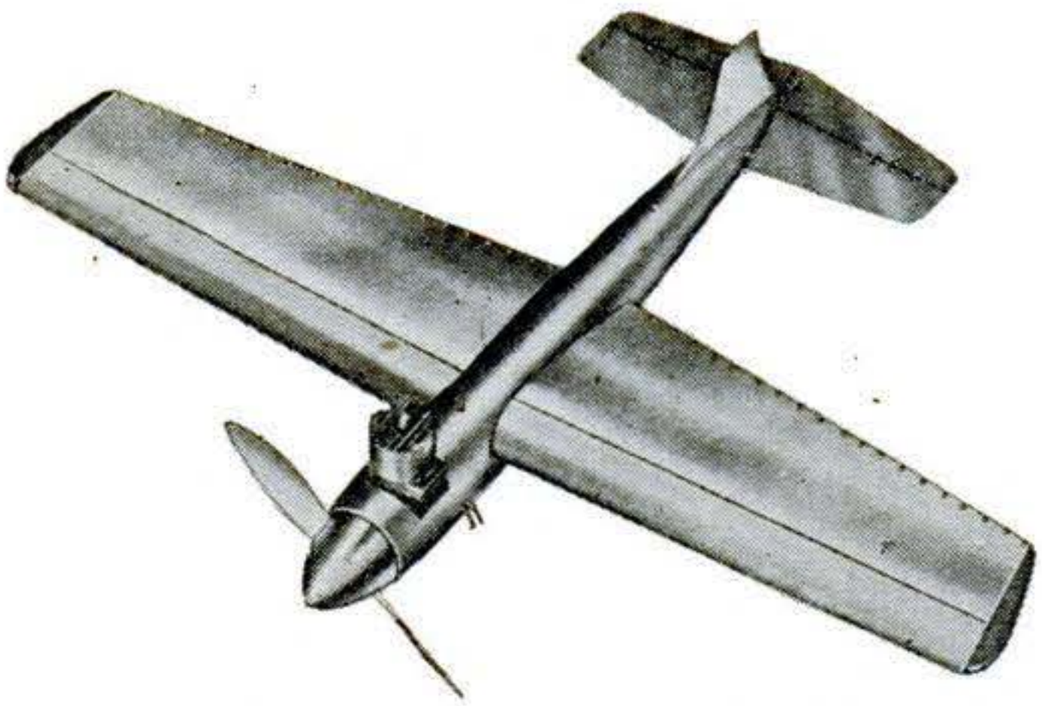
HOBBY SHOPPING



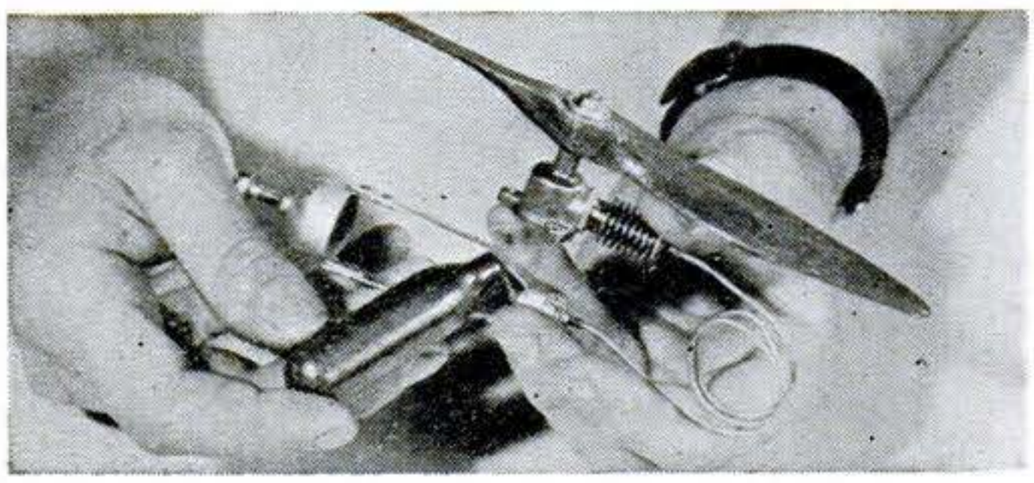
Lure Holds Live Bait. Imagine the surprise of a fish that comes to this lure. The minnow is alive, but is protected inside a transparent plastic casing that magnifies it to appetizing proportions. Made by the Rice Engineering Co., Detroit, Mich., the lure has two triple hooks and a removable head to permit insertion of the bait.



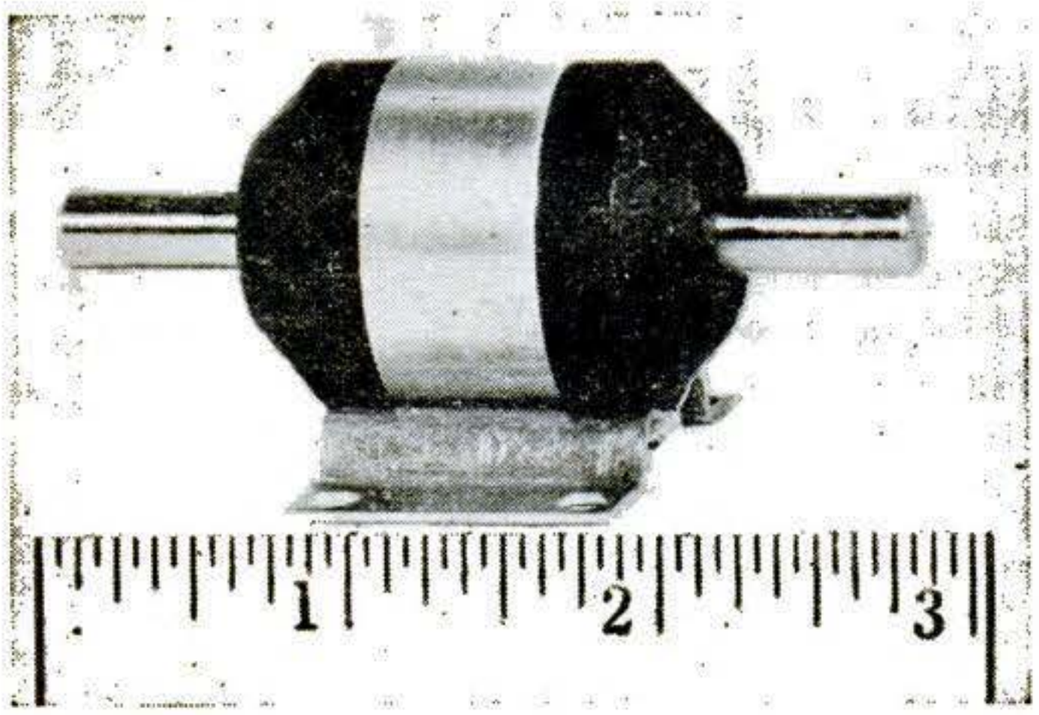
You Needn't Yell "Fore". Firmly tethered to a stake driven into the ground, this golf ball never gets away. You just step up, smack it, and let it swing—but better keep out of the way. Manufactured by the Prac-Tee Company, Dayton, Ohio, the outfit is designed for backyard practice. It retails for around $3.50.



Plane Made of Magnesium. Built of magnesium, this model plane has the lightness of wood with far greater strength. It is furnished in kit form by Rokwell Industries, Inc., of Clayton, Mo. Wing, fuselage, and control surface sections are preformed.

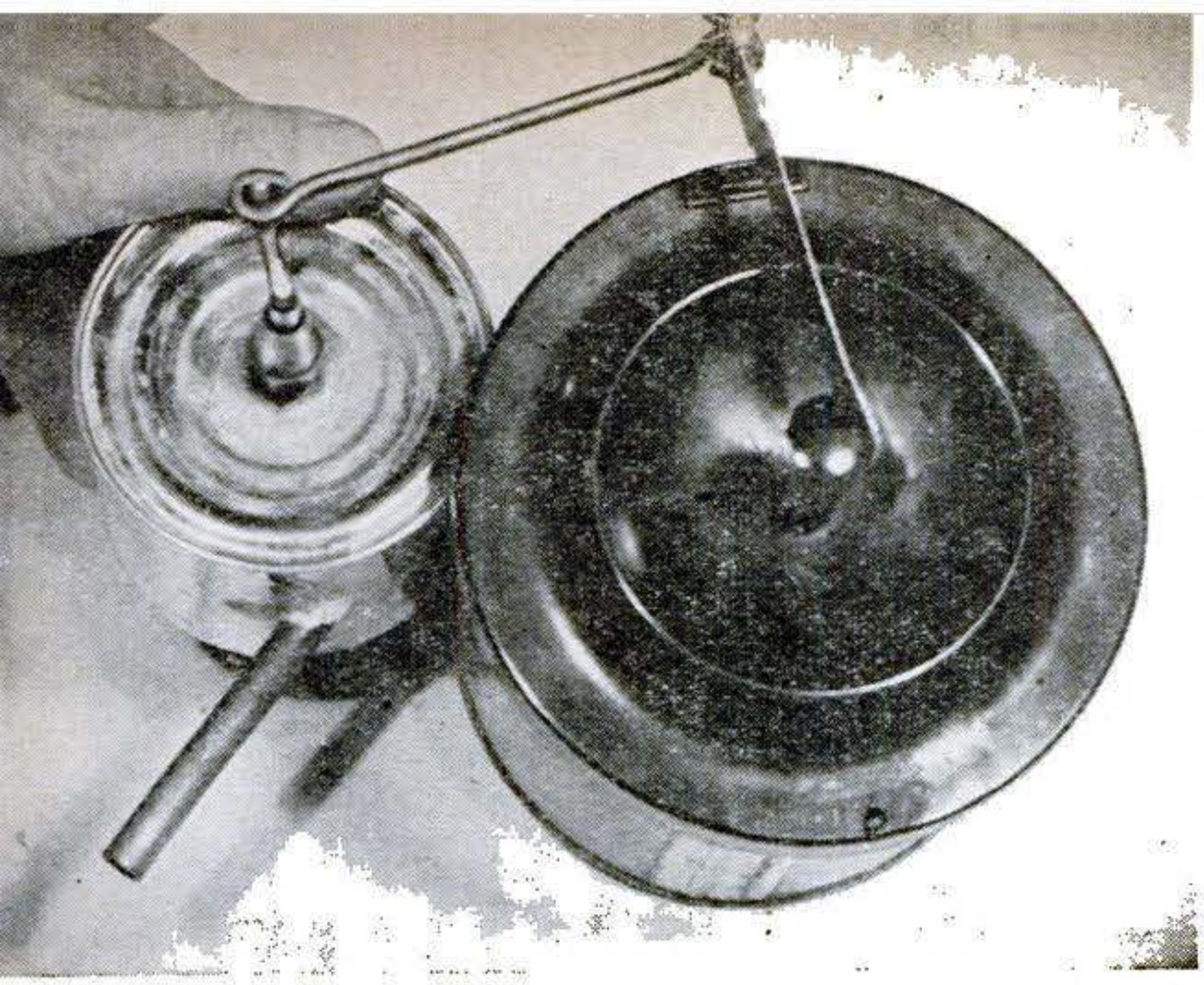


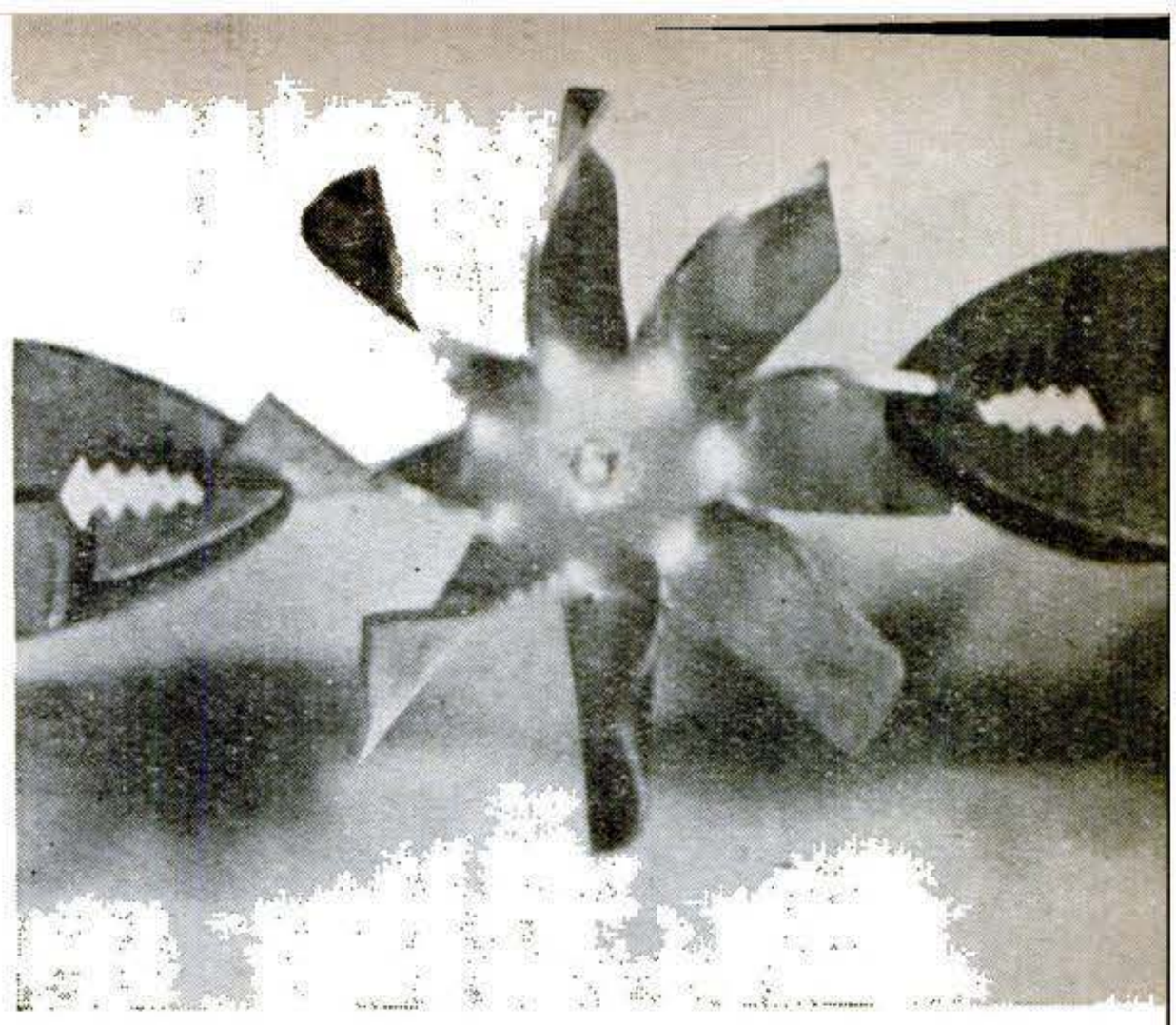
Carbon Dioxide Runs Engine. Standard carbon dioxide cartridges power a model airplane engine produced by the Herkimer Tool and Model Works, Inc., of New York. Weighing less than ¾ oz., the engine has a finned steel cylinder, can be adjusted to run up to 60 sec. on a charge, and swings a 7" propeller with ease. It's suitable for model planes up to 140 sq. in. wing area. The engine sells for about $7.50.



Speed Changer Aids Hobbyists. Designed to increase or decrease shaft speeds in small power devices, this miniature gear box is available in various gear ratios. Built by the Metron Instrument Company, Denver, Colo., it has concentric drive shafts mounted in ball bearings. Power passes from the input shaft through spur gears to a countershaft, thence through another set of gears to the output shaft. Intermediate gears run in graphitic plastic bearings. The price runs from $16 to $18.50, depending on the ratio.

Copyrighted material



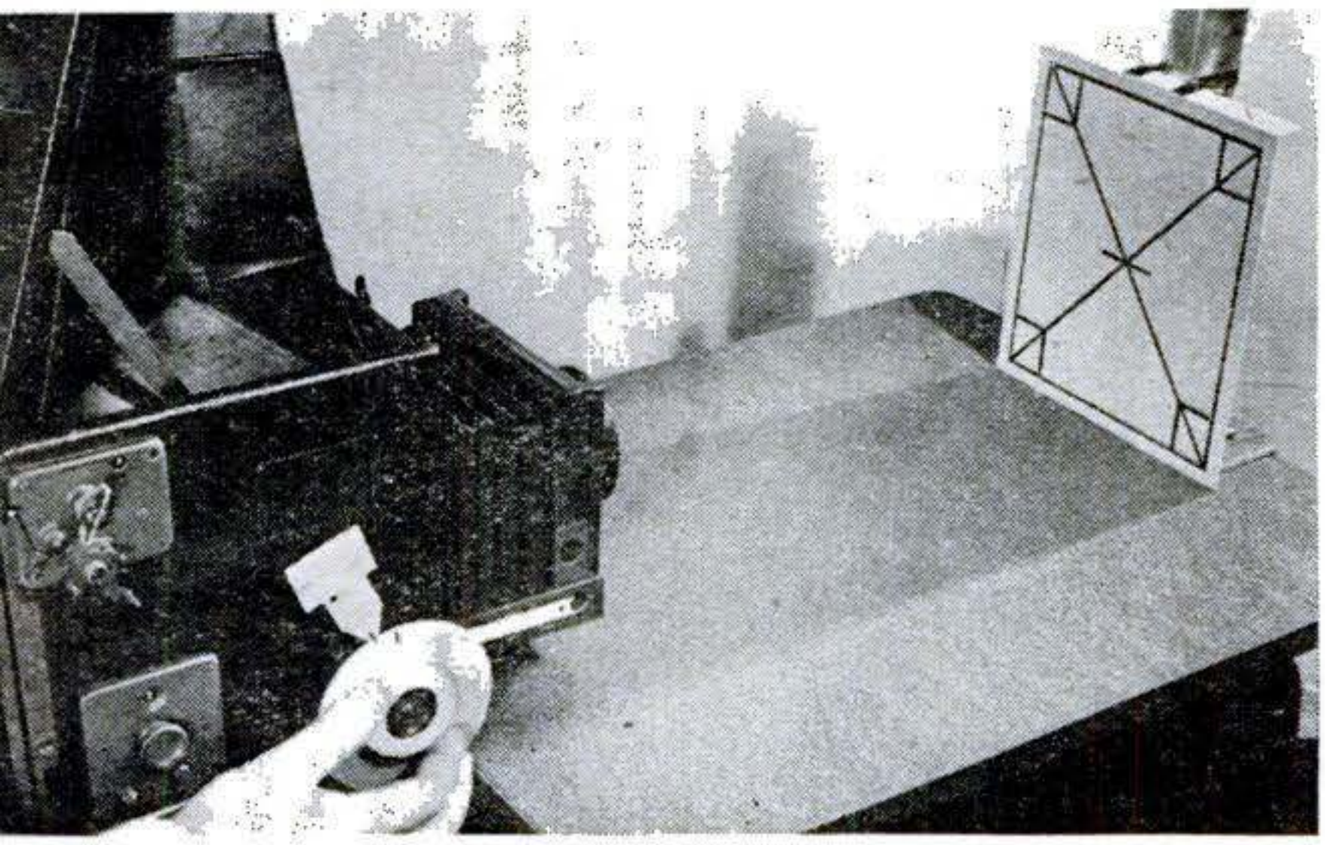


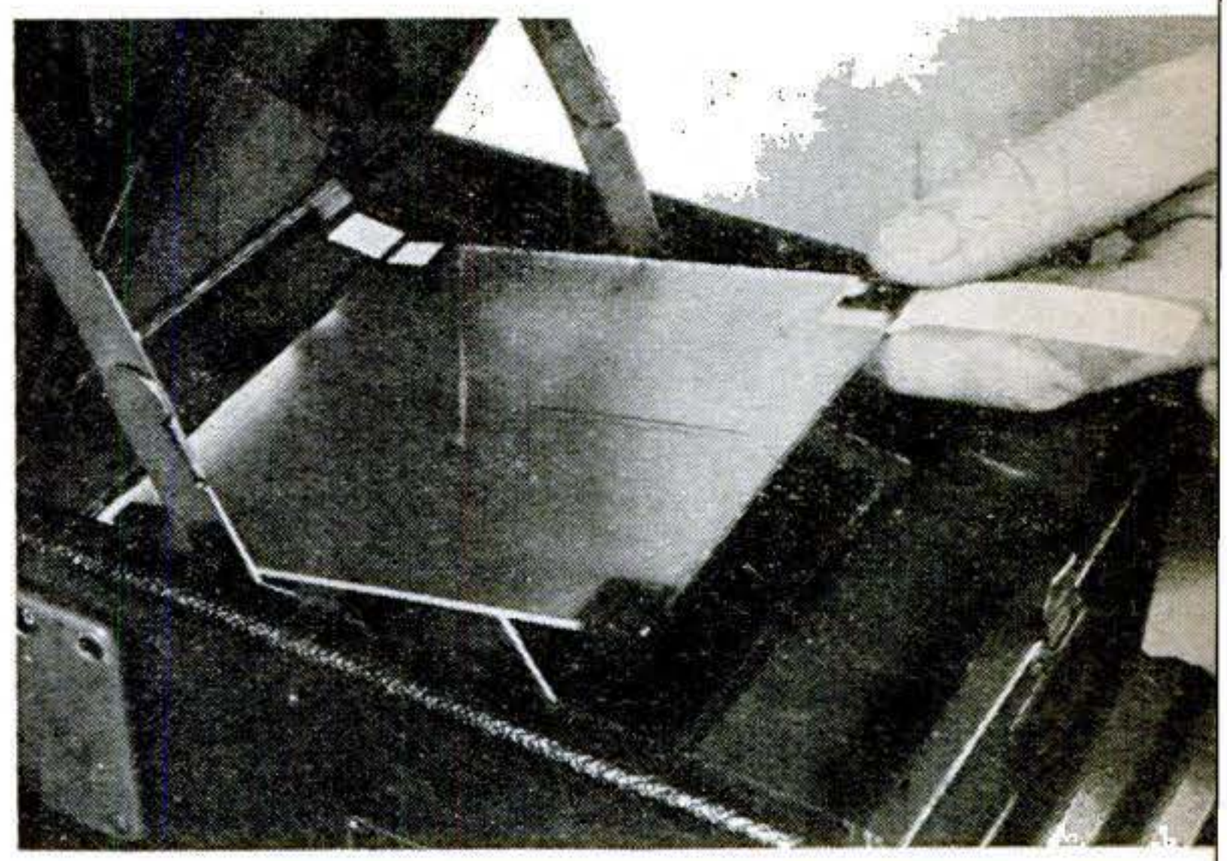
Water Power Agitates Roll-Film Developing Tank

WITH this water-driven agitator, you can avoid the tedious job of agitating a roll-film tank by hand. A revolving crank on the water wheel moves a metal arm, bolted to the tank knob, back and forth through an arc by a pivoted linkage.

Solder a can upside down against the side of another large enough to hold the tank. Punch a center hole in the bottom of the first and solder in a short piece of copper tubing as a bearing. For the water nozzle, solder another piece of tubing at a tangent into the side. Make the rotor from a disk of thin brass or copper as at right above.

Brazing rod may be used for the shaft and linkage. After bending a crank, thrust the shaft through the bearing, and solder on the rotor. Slot one end of the knob arm and curl and solder the fork so formed around a brass pin on which the linkage pivots. File a flat on one side of the knob to make it easier to bolt the arm fast.





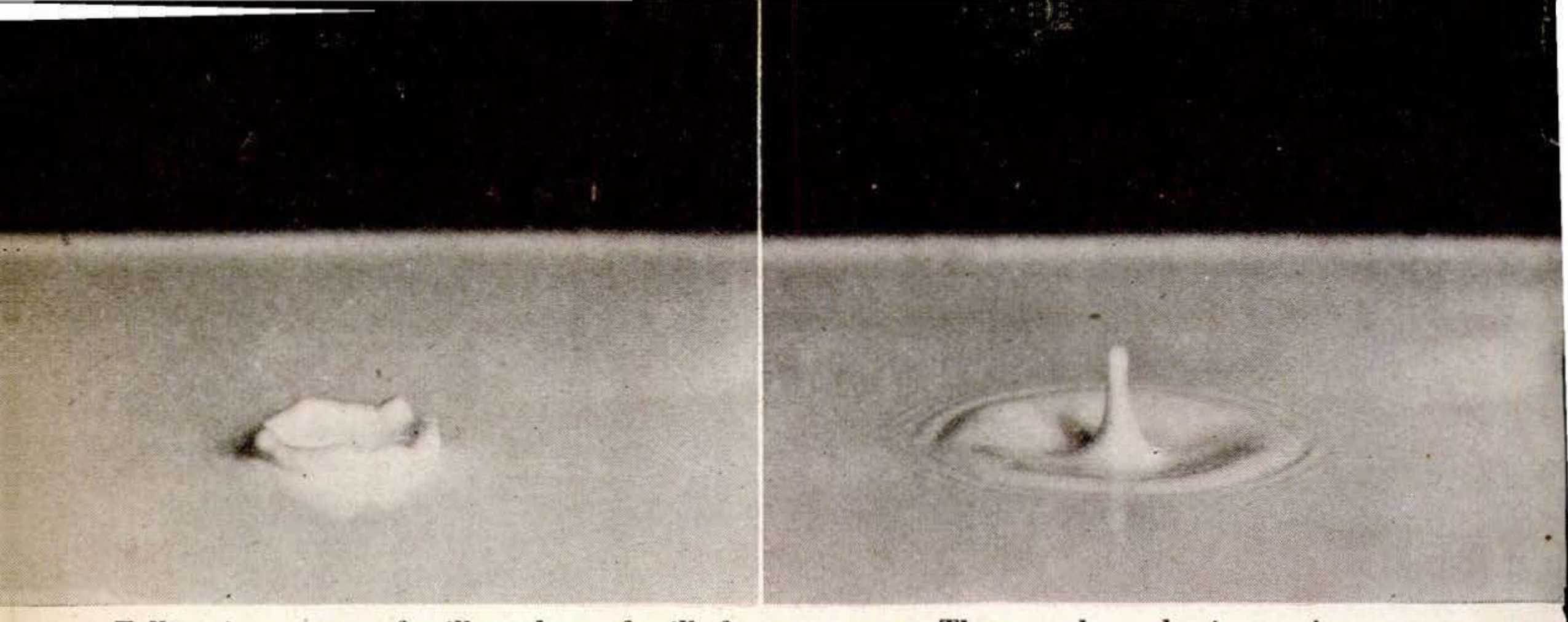
Reflex Focusing Screen Checked by Simple Method

WHETHER the focusing screen of a single-lens reflex camera is accurate may be checked by placing the camera about 36″ from an ink-lined cardboard sheet, stopping the lens down to f/8, and installing a back focusing screen in the exact film plane.

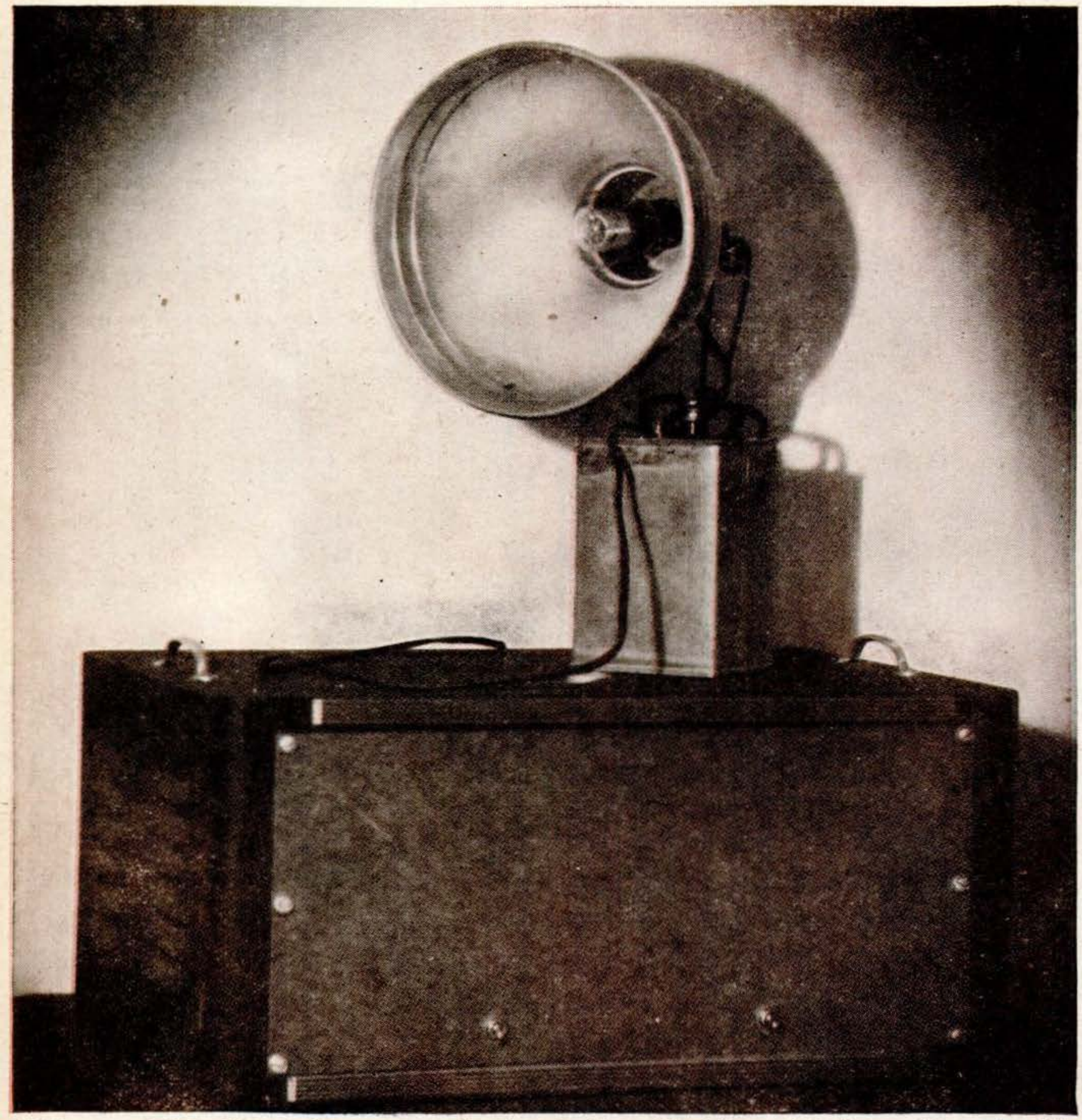
The screen may be ground glass in a film-pack adapter, or, in a roll-film camera, it may be taped in place. Also attach a cardboard dial firmly to the focusing knob and a cardboard pointer to the camera.

After focusing the image sharply on the back screen, turn the knob until the lines begin to blur and mark the dial at the pointer. Then move the lens back through the sharp area until the lines again blur and mark this point also. Focus the top screen the same way. If the latter is accurate, the sets of marks will coincide. If they do not, check the action of the mirror. The screen can be raised, if necessary, with tape under the corners (right above).—H. R. HEYDORF.

Copyrighted material

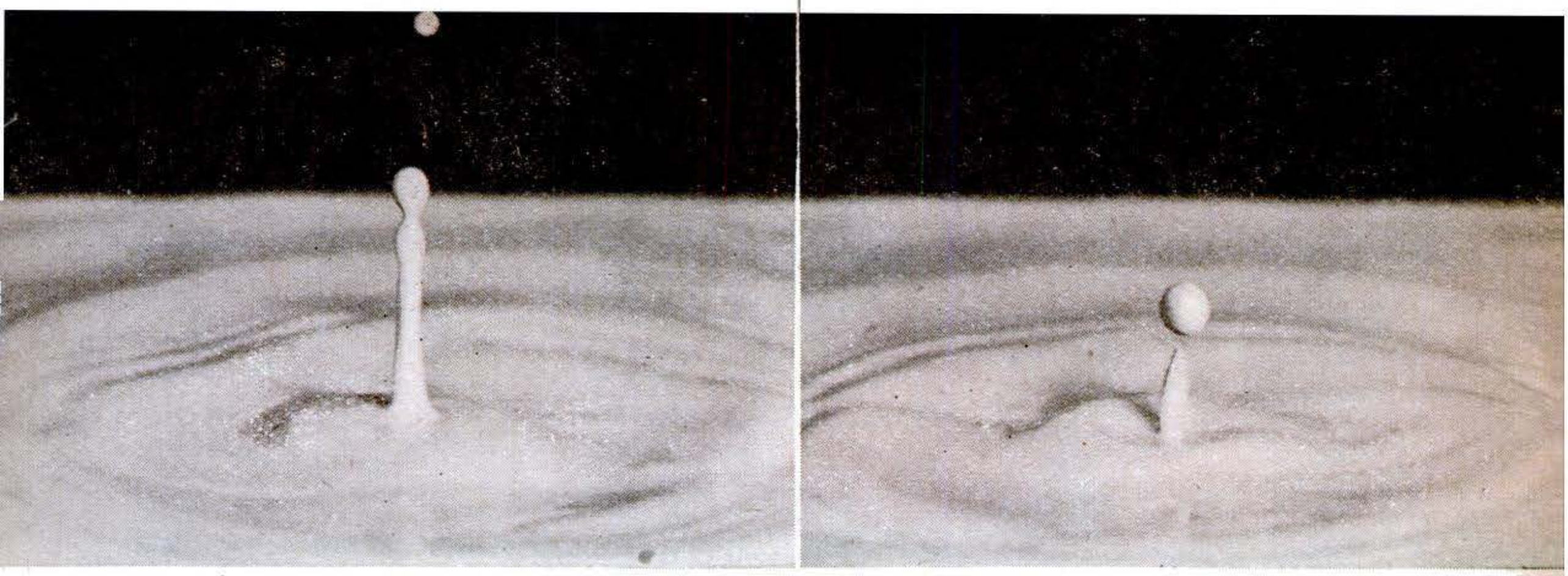


Falling into a pan of milk, a drop of milk forms a crater. Then a column begins to rise . . .



Fully assembled, the unit is compact and quite easy to move from place to place. An ordinary radio cabinet is used to house the parts. The two control switches may be seen on the front.

Copyrighted material



A droplet breaks away and goes higher. Falling, the drop causes the same cycle to repeat.

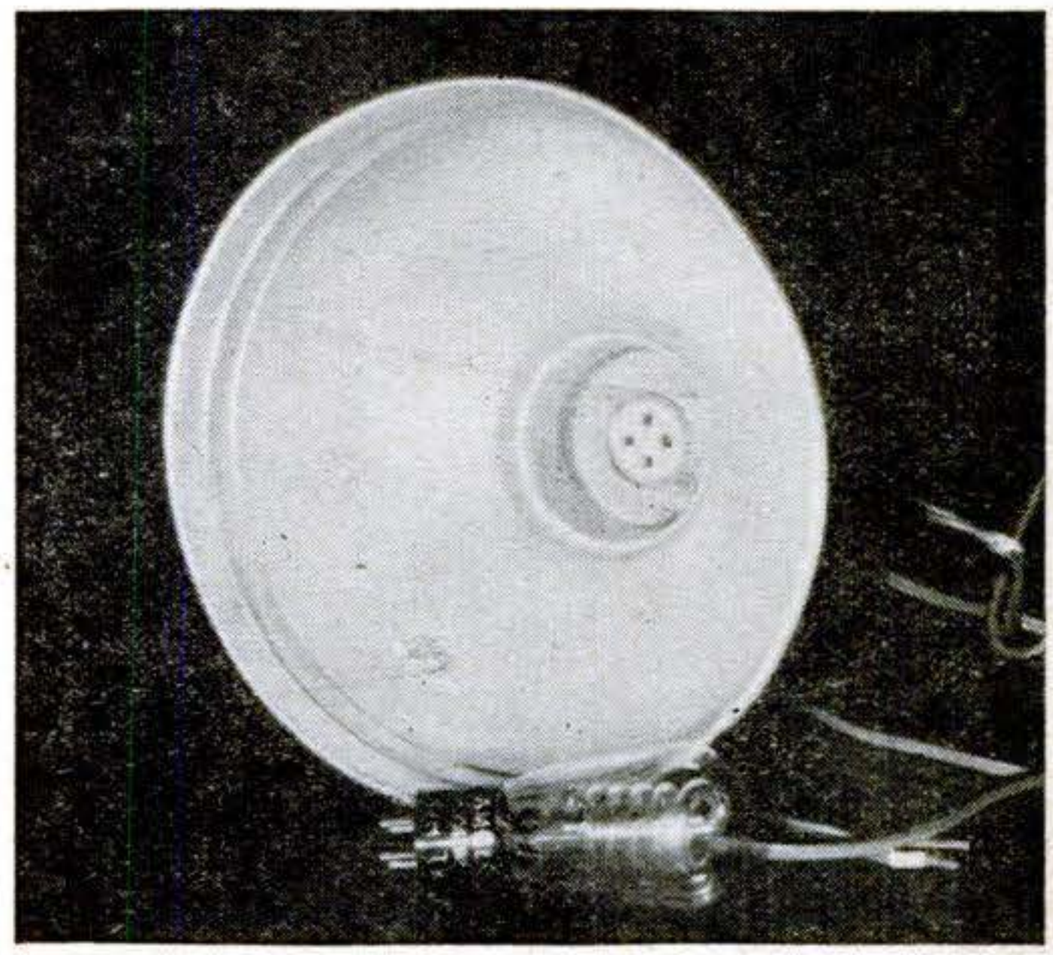
Homemade Speed Flash Makes Time Stand Still

By Michael S. Spacek, Jr.

HOW often have you sighed over those fast-action shots that weren't quite fast enough? How many times have ordinary synchronized flash and a shutter speed of 1/500 proved sluggish when the negative was developed? Well, you can capture the briefest part of a movement and get fine, clear detail of people or objects no matter how rapidly they may be shifting. Your top shutter speed won't matter, either, because you'll be using bulb exposure for the most part.

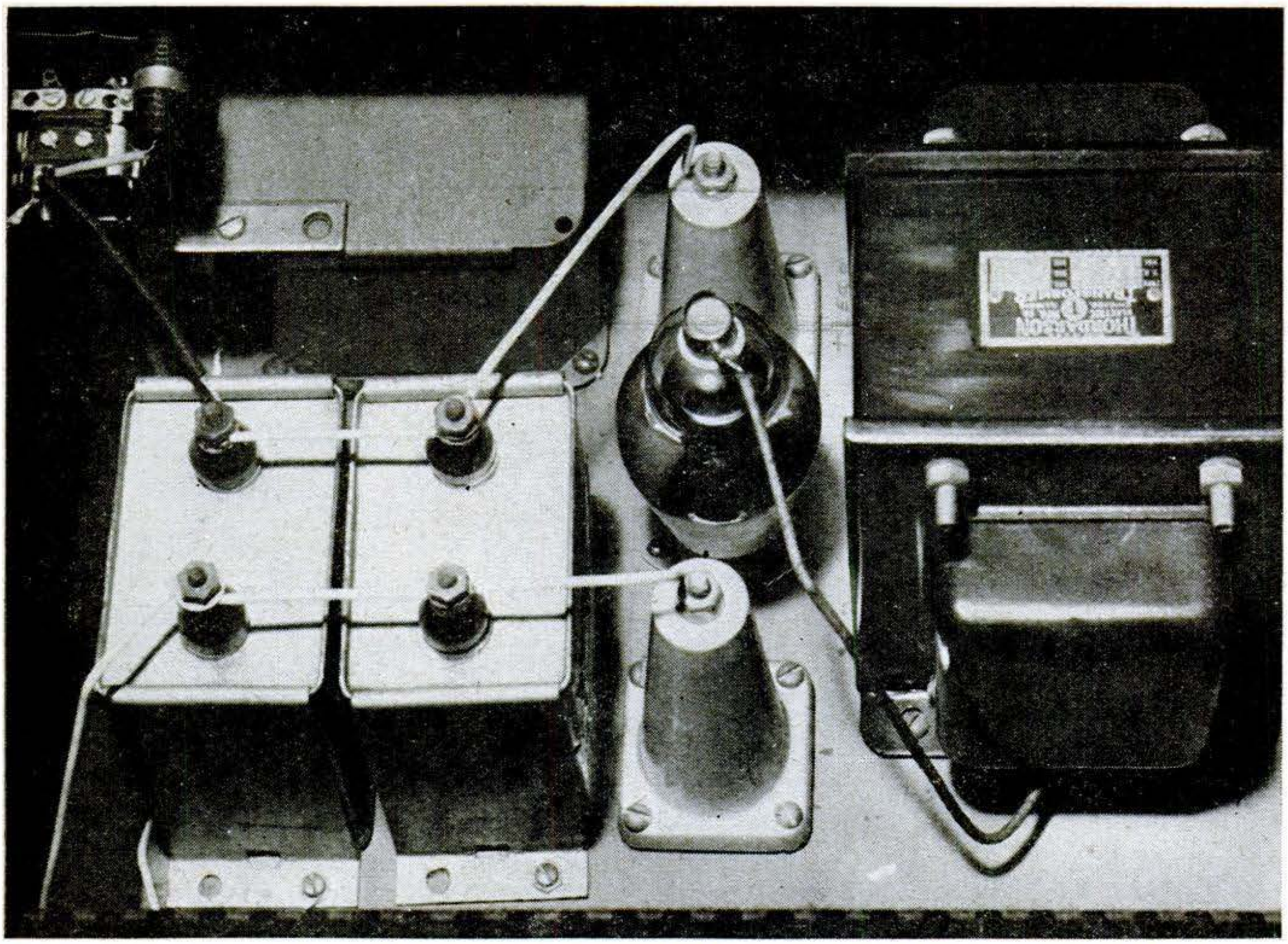
The trick, of course, is to control the light source. Here's a device that really cuts it fine—down to 1/10,000 of a second! That will stop a lot of action the human eye can't even begin to follow. Take the pictures above, for example. They show four stages in the life of a milk drop. No matter how many times you may have seen it in real life, it's a safe bet it never looked like that before. These shots were taken by the open-flash method in which the camera is set on time, the light is fired, and the shutter is closed.

What that means, among other things, is that even after you have built your high-speed flash equipment you won't be able to sit back and let the machinery do the work. Photographic skill will still be the main ingredient of good pictures. Obviously speed isn't called for if you are shooting still lifes, but if you want to record the instant that a dropped glass shatters or find out what the impact of a bat on a baseball is like, you'll have to trigger the shutter and light relay at just the right instant. Some shots are bound to be wasted, but with practice the number will get smaller. The sequence above, for example, was selected from 10 neg-



Mount the tube in a photo reflector. Install a four-prong radio socket to take the flash tube.

Copyrighted material



Heavy-gauge wire and stand-off insulators keep leads from touching or shorting to chassis.

atives. Each of them happened to show a distinctly different stage in the process.

While the particular unit shown here was designed chiefly for open-flash work, it can be synchronized with a camera shutter by substituting a low-voltage relay connected to any standard synchronizer. Switch S2 will then have to be a single-throw type in the transformer circuit only. This switch should be opened before the light is fired to avoid burning the relay points. After making the connection, adjust the synchronizer so that the light flashes during the time the shutter is open. With synchronization it will be possible to take pictures even in subdued outdoor light. Experiment with various combinations of fast shutter, small lens stop, and slow film until you find one in which the film is barely exposed by the ambient light. The instant of the high-intensity flash will then provide practically the only exposure for the negative.

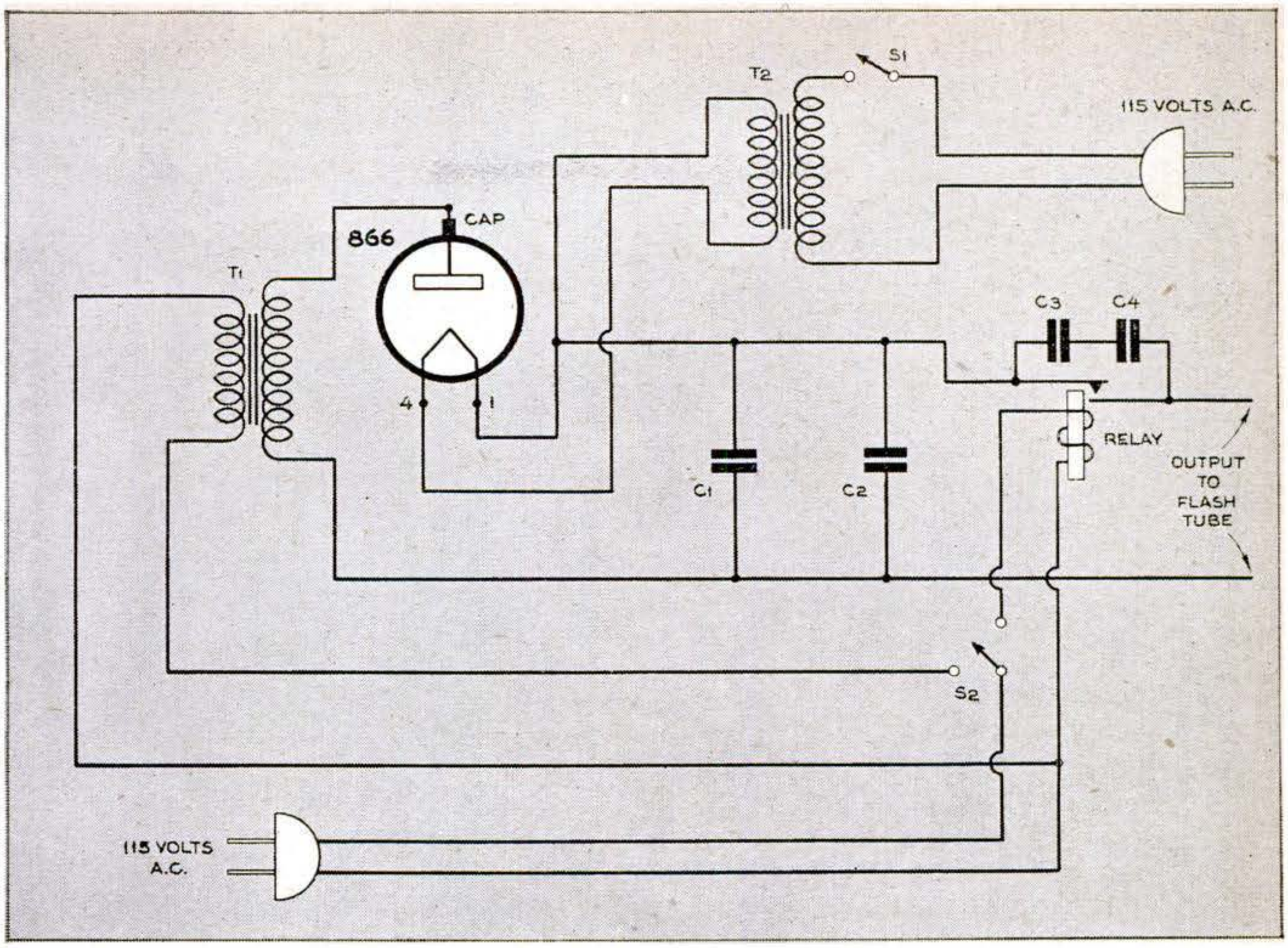
High-speed flash equipment is simple enough in principle. A transformer steps up your 115-volt AC to about 1,800 volts, and this voltage is then rectified and stored in a bank of condensers. At the proper instant the charge is effectively short-circuited through a low-resistance load represented by the flash tube. The tube lights up brilliantly for the tiny fraction of a second it takes the stored charge to break down below the strike voltage needed to activate the tube.

The flash tube has a rated output 100 times that of sunlight, so that it is good for color as well as black-and-white. It should last for thousands of flashes—which, incidentally, makes this an economical flash outfit even for straight shots you'd ordinarily make with flash bulbs.

Parts are mounted on an 11″ by 16″ radio chassis with machine screws, and connections are made with heavy-gauge wire. All wire is insulated, and the high-voltage leads separated from the chassis by stand-off insulators. The entire unit is encased in a metal box.

For the circuit-closing device, a heavy-duty, 115-volt SPST relay is used. To protect the relay points, two .01-mfd. condensers (C3, C4) are shunted across them. The relay side of the output line is the plus or positive side, and should be connected to the plus side of the flash tube as specified by the manufacturer.

Copyrighted material



The relay is in the positive output lead; this side goes to the plus end of the flash tube.

LIST OF PARTS

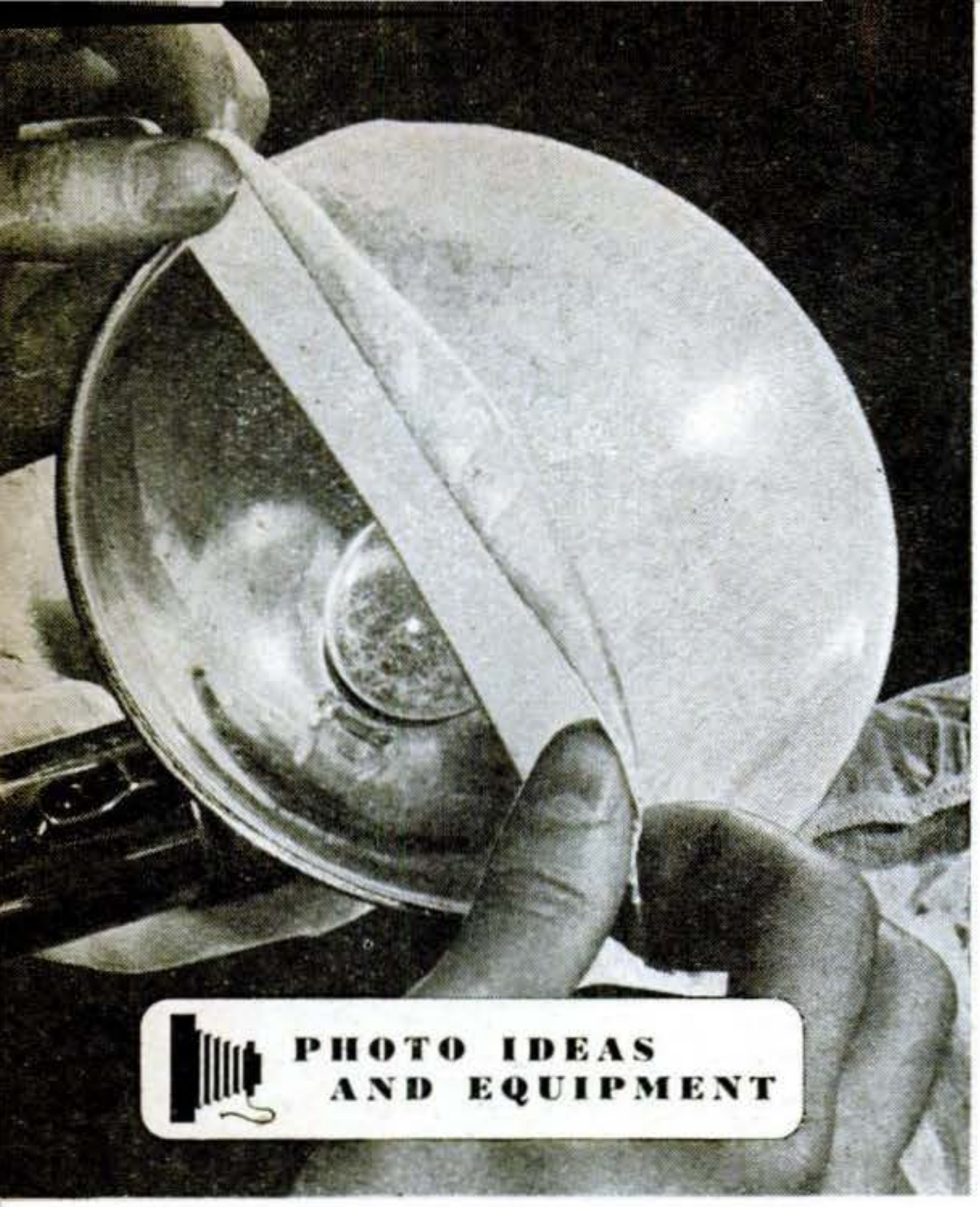
C1, C2: 10-mfd., 2,000-volt filter condensers.
C3, C4: .01 mfd. 1,600 volts.
T1: high-voltage trans., 1,800 volts, 50 ma.
T2: filament trans., 2.5 volts, 10 amp.
S1: SPST toggle.
S2: SPDT toggle or microswitch.
Relay: normally off, SPST, 115 volts, heavy duty.
Type 866 rectifier tube, two 4-prong ceramic tube sockets, Amglo series 51 photoflash tube, 12″ photo reflector, 11″ by 16″ chassis, two stand-off insulators.

Note that two separate plugs are indicated in the diagram; this simplifies switching and makes it harder to mistake the sequence of operation. It's always a good idea to let the filaments of a high-voltage rectifier warm up before turning on the plate juice. In using the flash outfit you do this by first connecting the filament line and closing switch S1. Wait a minute or so and then insert the high-voltage plug into an outlet. Switch S2 should be in the lower position to feed the transformer primary. In about five or ten seconds, the condenser bank will reach full charge, after which you can fire away by flipping S2 into its second position. This first opens the high-voltage circuit and in virtually the same motion energizes the relay and puts the voltage directly across the flash tube.

A word of caution: the condensers store a voltage in the neighborhood of 2,000. As this voltage strikes across the low breakdown resistance of the tube, enough current flows to end forever your interest in photography. The two things to remember, then, are that all your wiring, and particularly that part in the output circuit, must have sturdy, high-voltage insulation. Also, you must not, under any circumstances, tinker with a live circuit. Before touching any part of the wiring, be sure that both plugs are pulled and that you have discharged the condensers by shorting their terminals with a well-insulated screwdriver.

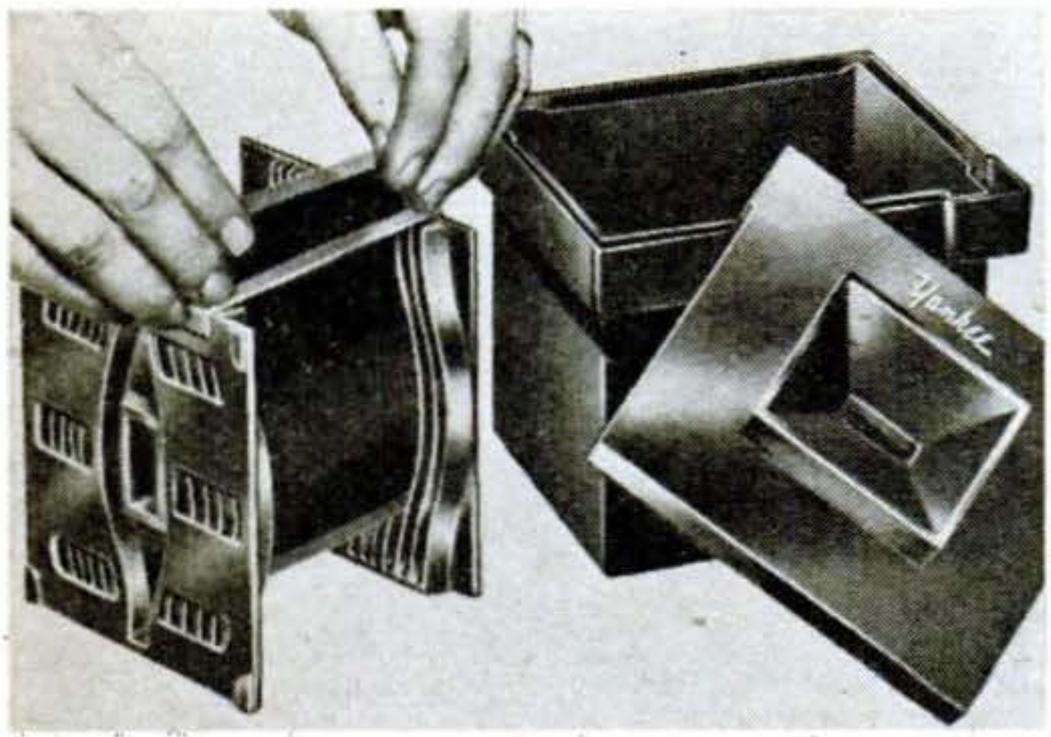
Correct exposure can be determined by a few trial shots. If the recommended values are used in building the unit, for film with a Weston rating of 50, f/11 should be about right with the camera and flash 6′ from the subject. END

Copyrighted material

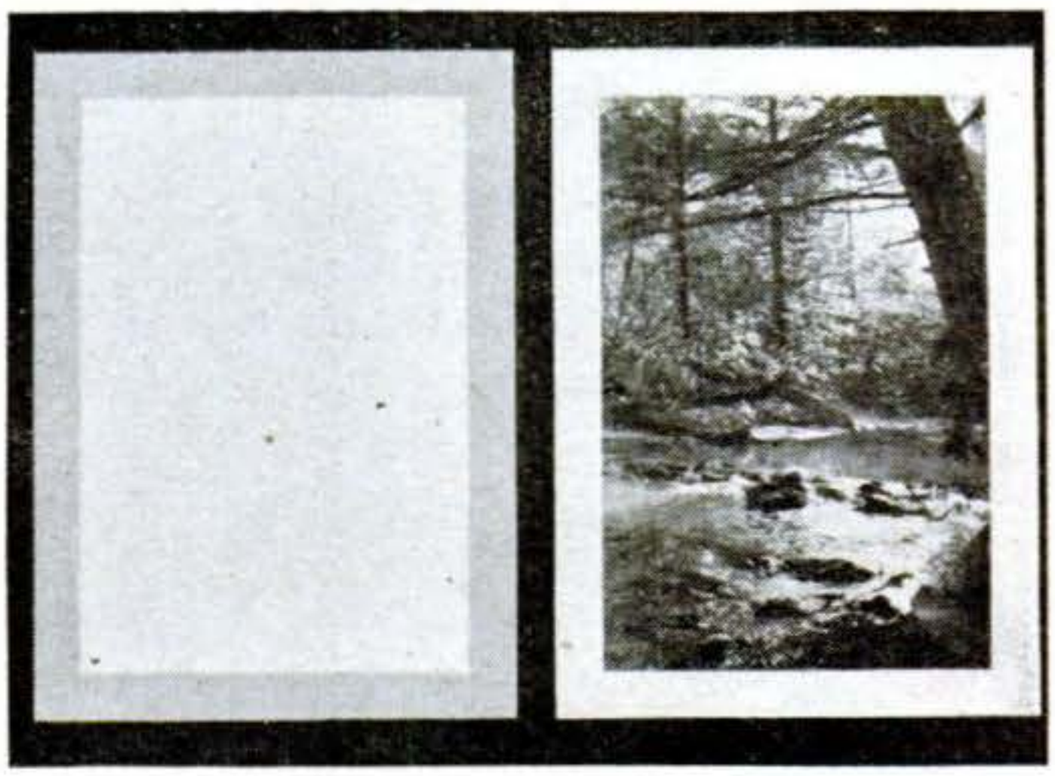


Diffusers Snap On. Made of a non-woven, plasticlike material, this diffuser has a strong elastic edge that permits it to be quickly snapped on or off the reflector. When not in use, it can be crumpled into small space and stuffed into the pocket or camera case. Manufactured by Martin Products Co., Brooklyn, N. Y., in sizes to suit all reflectors, the diffusers range in price from 25 cents to $1, depending on the size.

Dry Your Drying Alcohol. When alcohol is used for rapid drying of negatives, it eventually absorbs so much water that it is no longer effective. Its usefulness can be restored by immersing in it a little potassium carbonate (anhydrous) tied in a clean cloth. Because this chemical has such an affinity for water, it will remove the water from the alcohol. The chemical may be dried and used again.—R. F. DONAVAN.

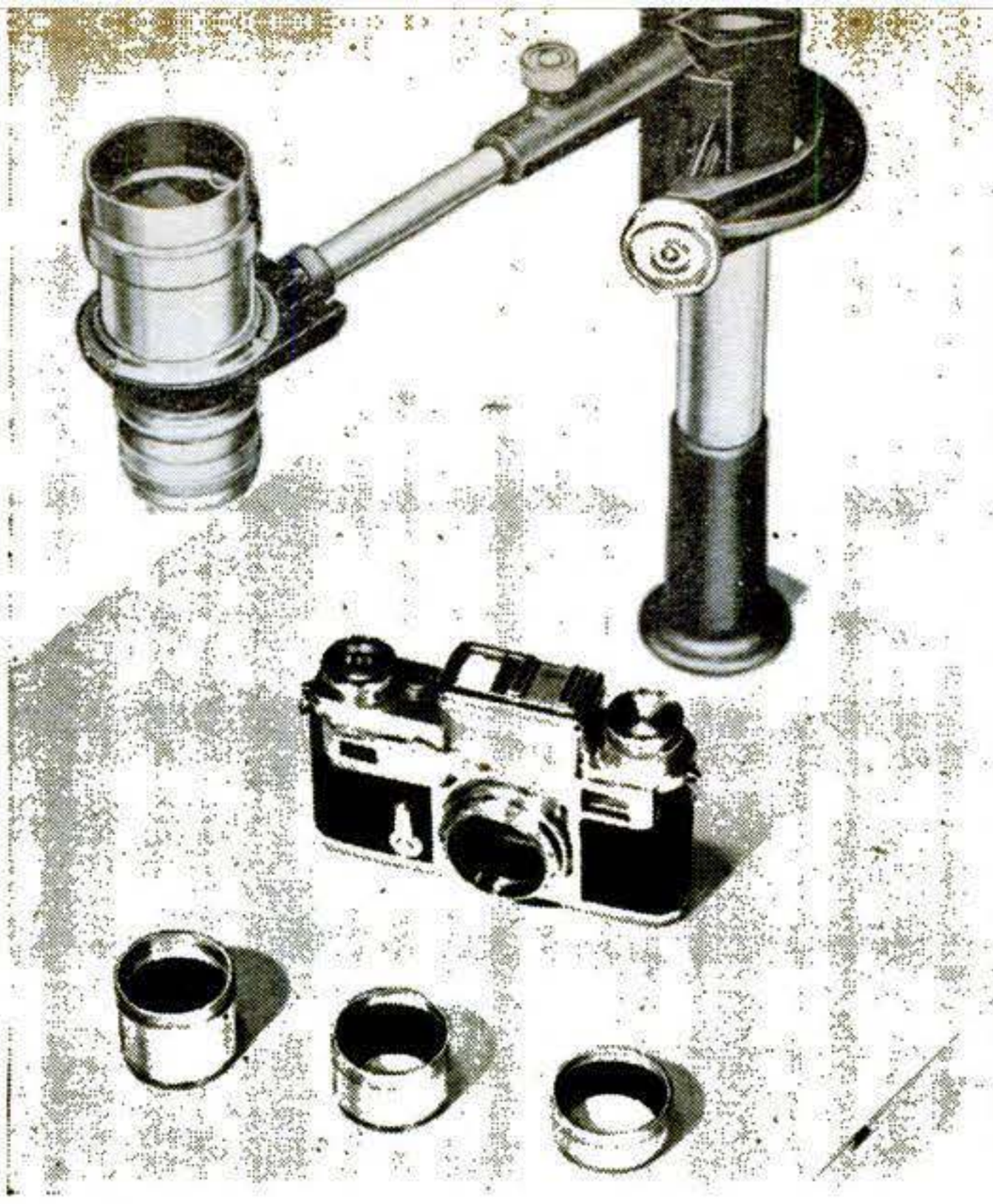


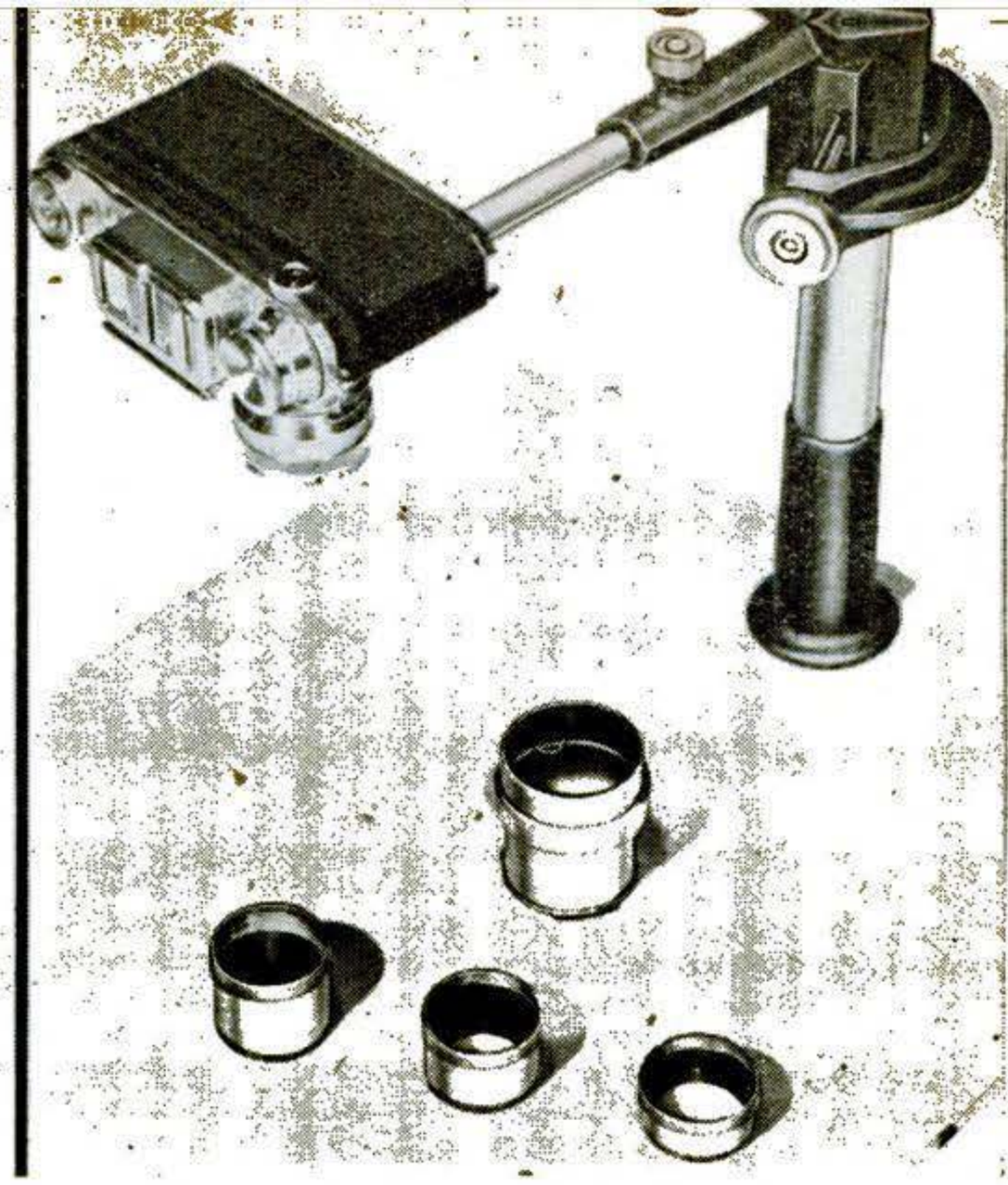
Tank Easily Agitated. An adjustable cut-film and film-pack developing tank, suitable for any size from 2¼″ by 3¼″ to 4″ by 5″, is produced by Windman Brothers, of Los Angeles. Four buttons on the bottom permit agitation by gentle rocking, and curved loading grooves keep the films under tension, preventing them from touching.



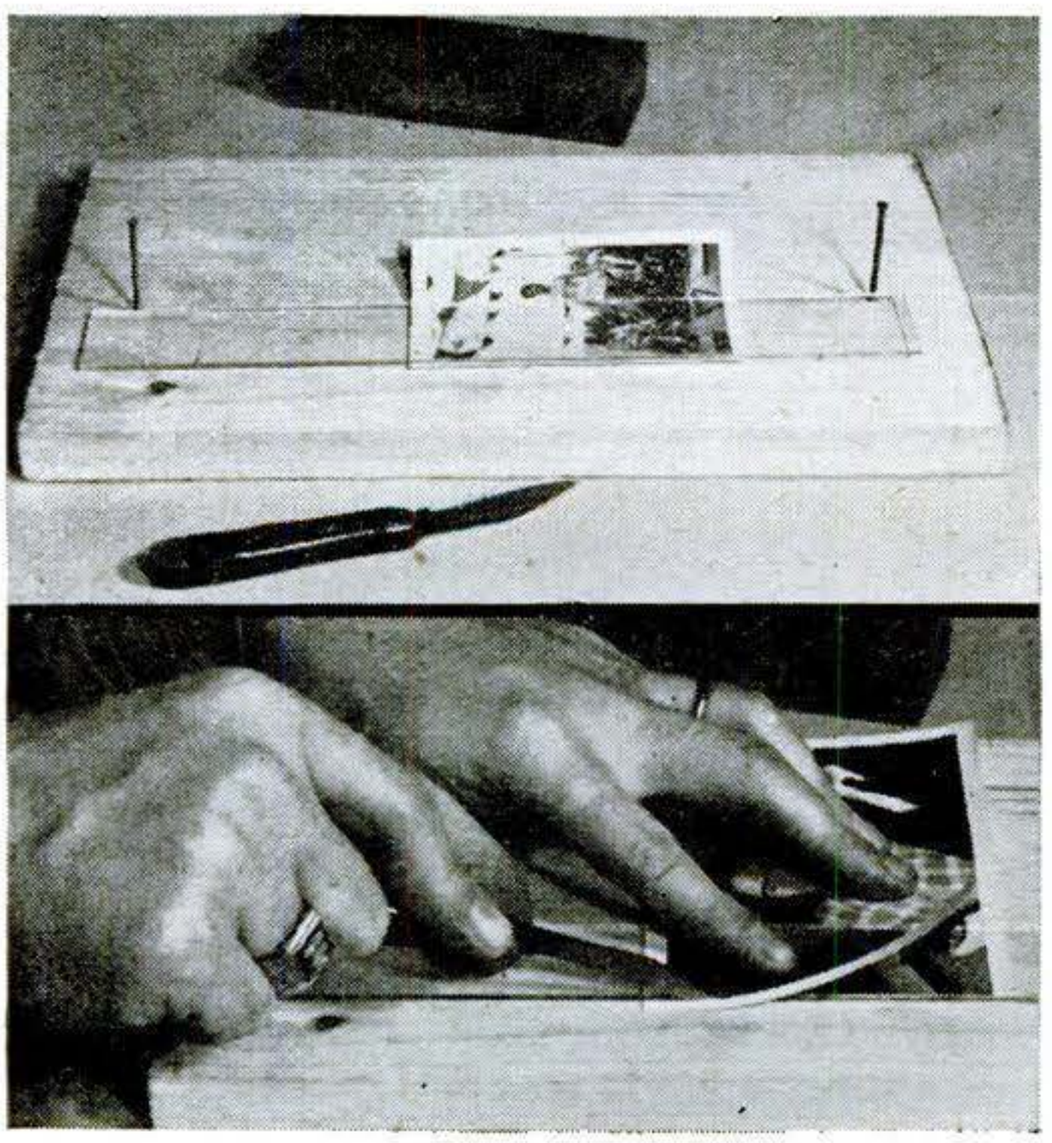
Paper Has Its Own Border. Contact paper offered by Devolite-Peerless, of New York, has a preprinted mask that leaves an even white border when the paper is processed. If examined before processing, a piece of the paper is seen to have a greenish-yellow line all around. This disappears in the hypo, leaving a glossy white border.

Copyrighted material

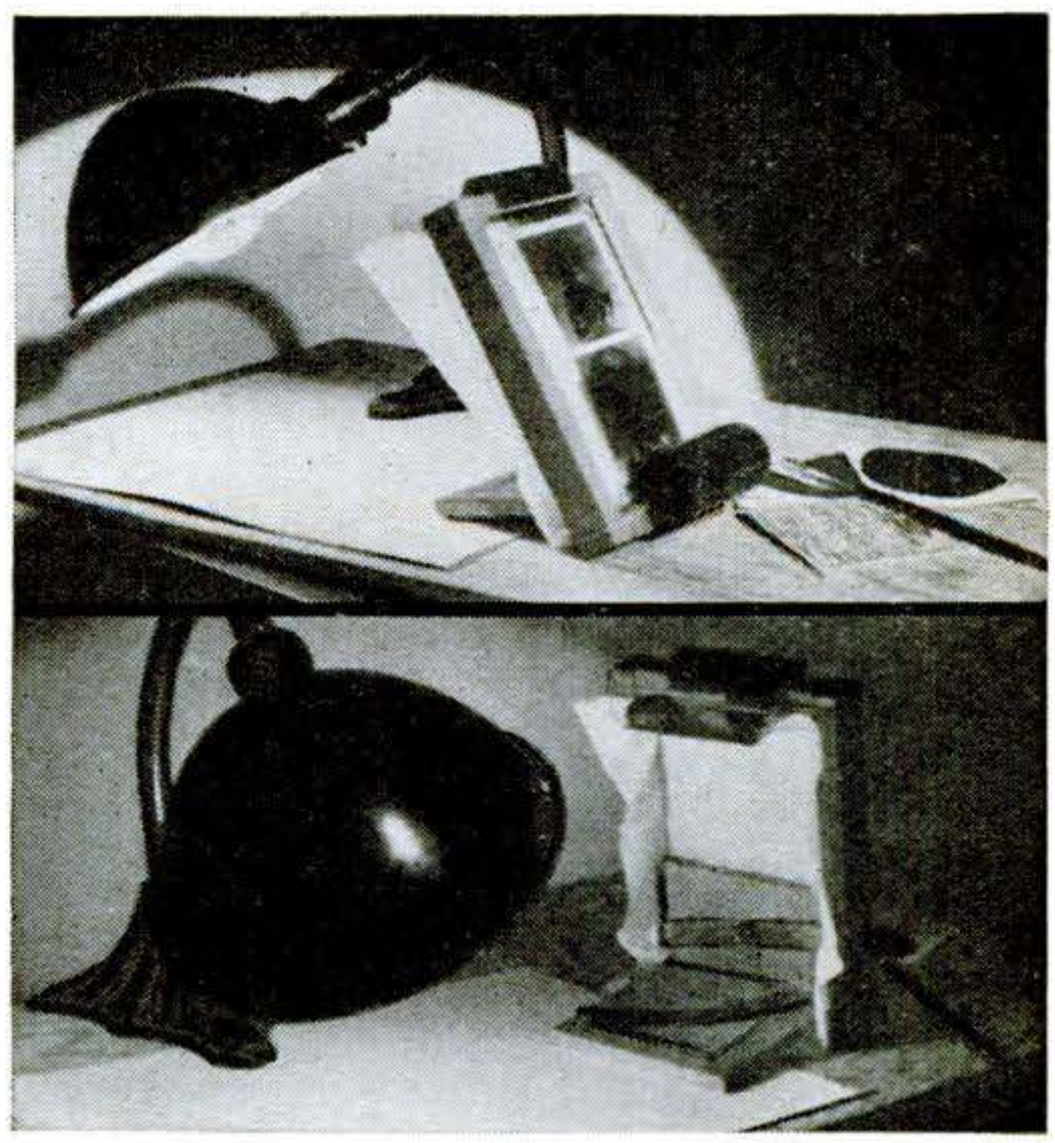




Attachments for Copying. Originated in Scotland, these new Stewartry copying attachments are distributed in the United States by Caprod, Ltd., of New York. Designed for use with Leica, Contax, and cameras of similar type, the attachments include a clamping arm, a focusing screen, and various extension tubes for work at close range. At the left, a Contax lens and the focusing screen are mounted on the arm. After focusing, the screen is removed and the camera mounted in its place, the film lying in the same plane as the screen. Three extension tubes are seen in the foreground.



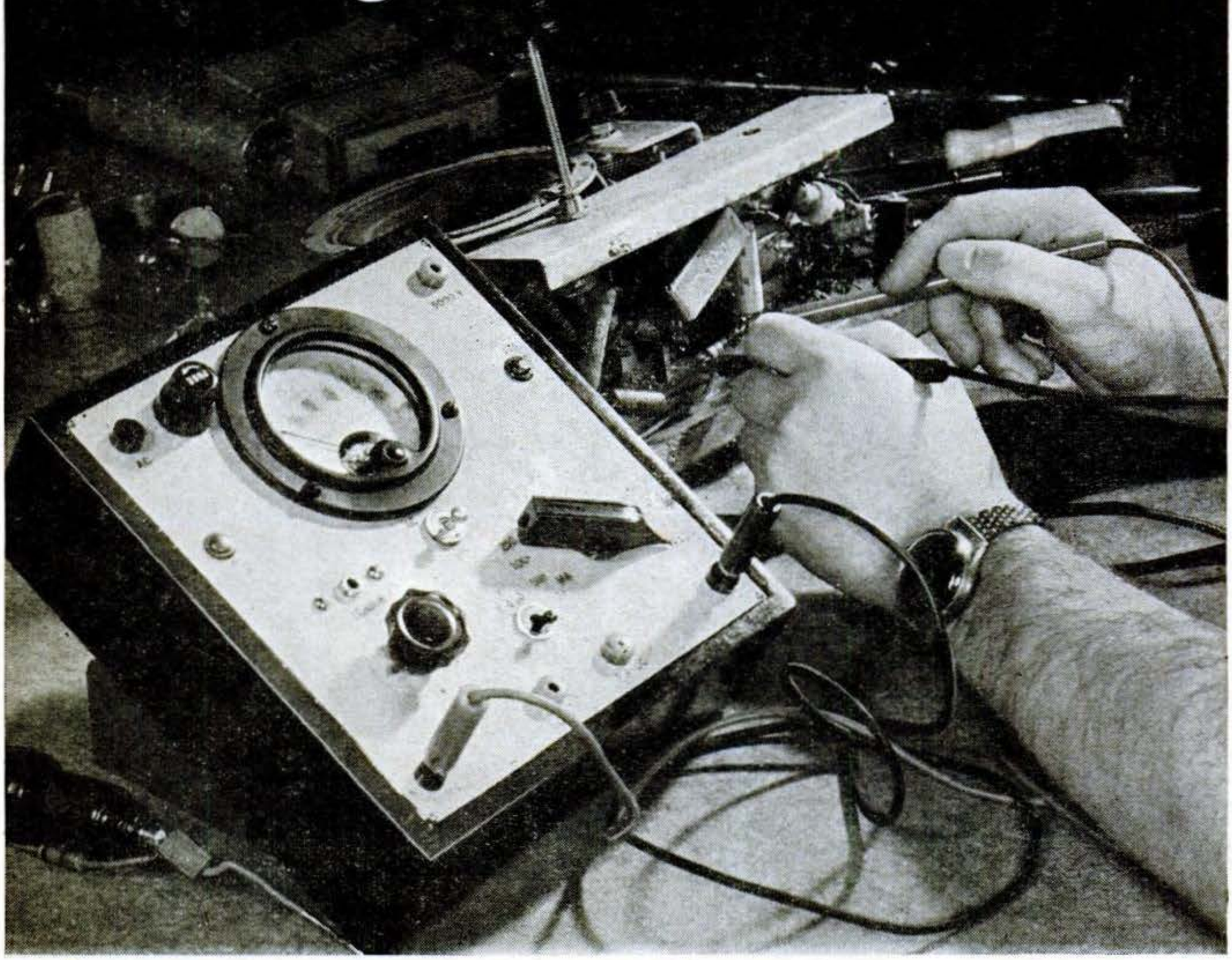
Glass Gives Even Borders. A glass straightedge provides a handy way of cutting even borders on a print. Shape the straightedge with a glass cutter, smooth the edges with an oil stone, and space two brads on a smooth board so the glass may be positioned against them. The glass makes it possible to see that the print is in the proper position for an even border.—L. K. Loomis.



Easel Made from Frame. A retouching or spotting easel may be improvised from an ordinary printing frame. As seen in the lower photo, the hinged back is clamped in place at the bottom of the frame, allowing one portion to act as a support. Tissue paper between the glass and frame gives even illumination. Rubber bands will hold uncut roll film in place.—E. J. Lurz.

Copyrighted material

Building a Multimeter PART 2



The multitester above, diagrammed on page 206, is a wide-range, general-purpose unit.

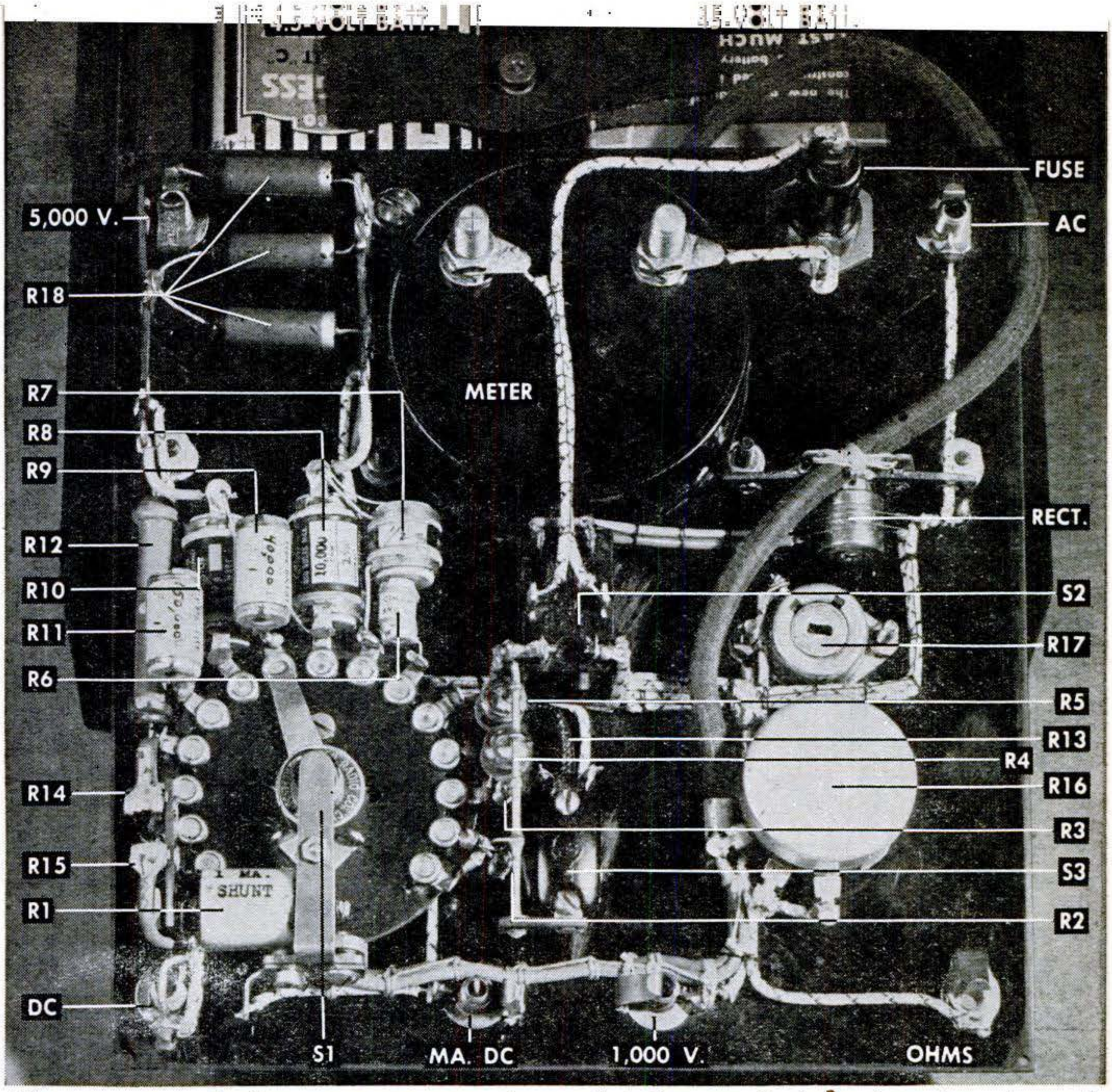
By Gilbert Sonbergh

BEFORE you start to build your own multitester, look over the fundamental data on the relationship between volts, ohms, and amperes given in the previous installment. With this information you can design a meter for any special purpose, adapt spare parts to suit your circuit, or build a general-utility multimeter for radio and electrical checking. To make use of spare parts, you must design your circuit around them, for you can't substitute values that are nearly but not quite correct. Resistors must be calculated with great precision. Wherever possible, use wire-wound resistors that are guaranteed accurate to 1 percent. Carbon resistors, costing much less than the wire-wound type, may be used in some cases, although they are less likely to be stable over a long period of time. They do, however, have one advantage in that they can be adjusted upward in resistance value. To do this, file a small flat on one side. Check the resistor on an accurate ohmmeter as you file it, and when you have exactly the right value, coat the scored part with wax or varnish to keep out moisture.

The photographs and the diagram on page 206 show a V-O-M meter designed to get the most measuring power in a relatively simple one-meter unit at moderate cost. With the aid of a few calibration graphs, this tester can cover more than 24 ranges of ohms, microfarads, henrys, AC and DC volts and milliamperes.

Suggested diagrams for simpler and less costly meters are given on page 207. Both of these models use standard O-1 ma. meters and simplified switching systems. In the diagram at the left, toggle or pushbutton station-selector switches are employed; note that the 10- and 100-ma., as well as the

Copyrighted material



All parts except the batteries are mounted on a bakelite panel, shown here from beneath.

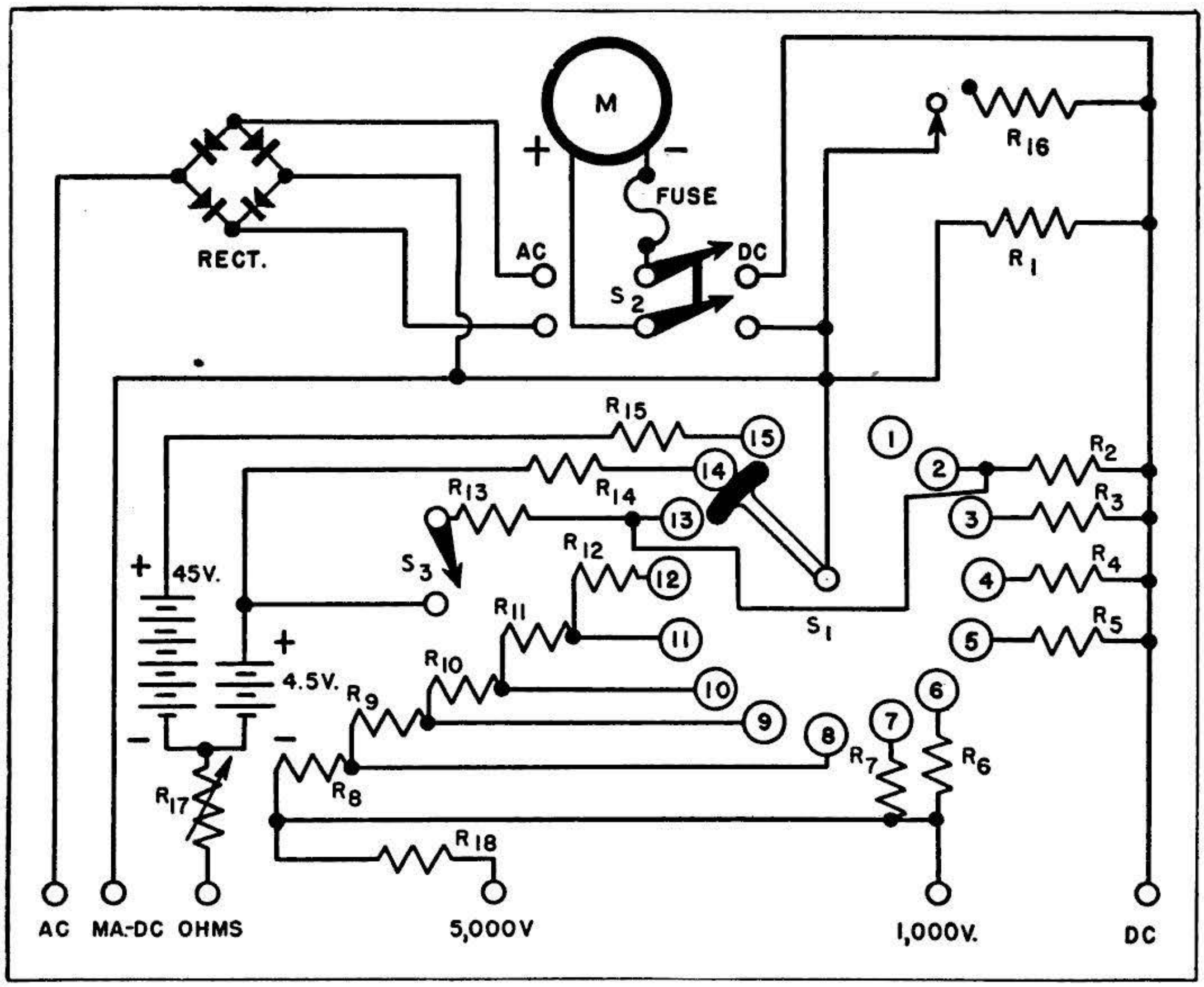
ohms-divided-by-ten ranges call for double-pole arrangements. If pushbutton switches are used, depress two buttons simultaneously. The companion drawing calls for only one switch, and this is on R16 so that the 10,000-ohm resistor can be cut out of the circuit for readings other than ohms.

No matter what meter you elect to build, two general precautions should be observed. First, avoid meter overloads, especially in switching. Second, make certain that components are satisfactorily outside the circuit or isolated when the meter is positioned on a range not calling for them. For example, the meter in our principal circuit would be seriously overloaded if you switched from one milliampere range to another while making a measurement except for the fact that the rotor of S1 touches one contact before leaving the previous one.

Despite all precautions, accidents do happen, which is why all circuits display fuses. The type of fuse to use is one that will "let go" quickly on currents 10 to 25 times greater than the meter's normal full-scale capacity. The resistance of the fuse, however becomes part of the circuit and must be taken into account in all calculations. Make sure you can get replacements of exactly the same resistance. A good procedure is to pick some identical fuses from your dealer's stock with the aid of a low-range ohmmeter.

Our major circuit contains a feature that is well worth considering in the design of your own multitester: it has equal sensitivity of 1,000-ohms-per-volt on both the AC and DC ranges, making it possible to use the same set of multipliers and main selector switch for both currents. This arrangement cannot be achieved with an ordinary O-1 ma. movement, but calls for a meter that will give full-scale deflection on .89 to .9 ma. for use with the full-wave rectifier connec-

Copyrighted material



LIST OF PARTS

M: DC milliammeter with full-scale sensitivity of 0 to .89 ma. and internal resistance of 105 ohms.
Fuse: 1/32 amp., tested at exactly 20 ohms.
S1: 15-position, meter-type rotary.
S2: DPDT toggle (AC-DC).
S3: SPST (ohms-divided-by-ten).
Rect.: full-wave meter rectifier.
R1: 1,011 ohms (1-ma. DC shunt).
R2: 12.36 ohms, wire (10-ma. shunt).
R3: 2.27 ohms, wire (50-ma. shunt).
R4: 1.124 ohms, wire (100-ma. shunt).
R5: 0.447 ohms, wire (250-ma. shunt).
R6: 890 ohms (1-volt multiplier).
R7: 4,900 ohms (5-volt multiplier).
R8: 9,900 ohms (10-volt multiplier).
R9: 40,000 ohms (for 50-volt range with R8).
R10: 50,000 ohms (for 100-volt range with R8-9).
R11: 150,000 ohms (for 250-volt range with R8-10).
R-12: .75 meg. (for 1,000-volt range with R8-11).
R-13: 439 ohms (450 ohms center scale).
R14: 4,400 ohms (4,500 ohms center scale).
R15: 45,000 ohms (45,000 ohms center scale).
R16: 10,000-ohm wire-wound rheostat with "off" or open position (series ohmmeter zero adjustment).
R17: 500-ohm wire-wound rheostat (shunt ohmmeter zero adjustment).
R18: 1-watt carbon resistors in series, totaling 4 meg. (5,000-volt multiplier with R8-12).

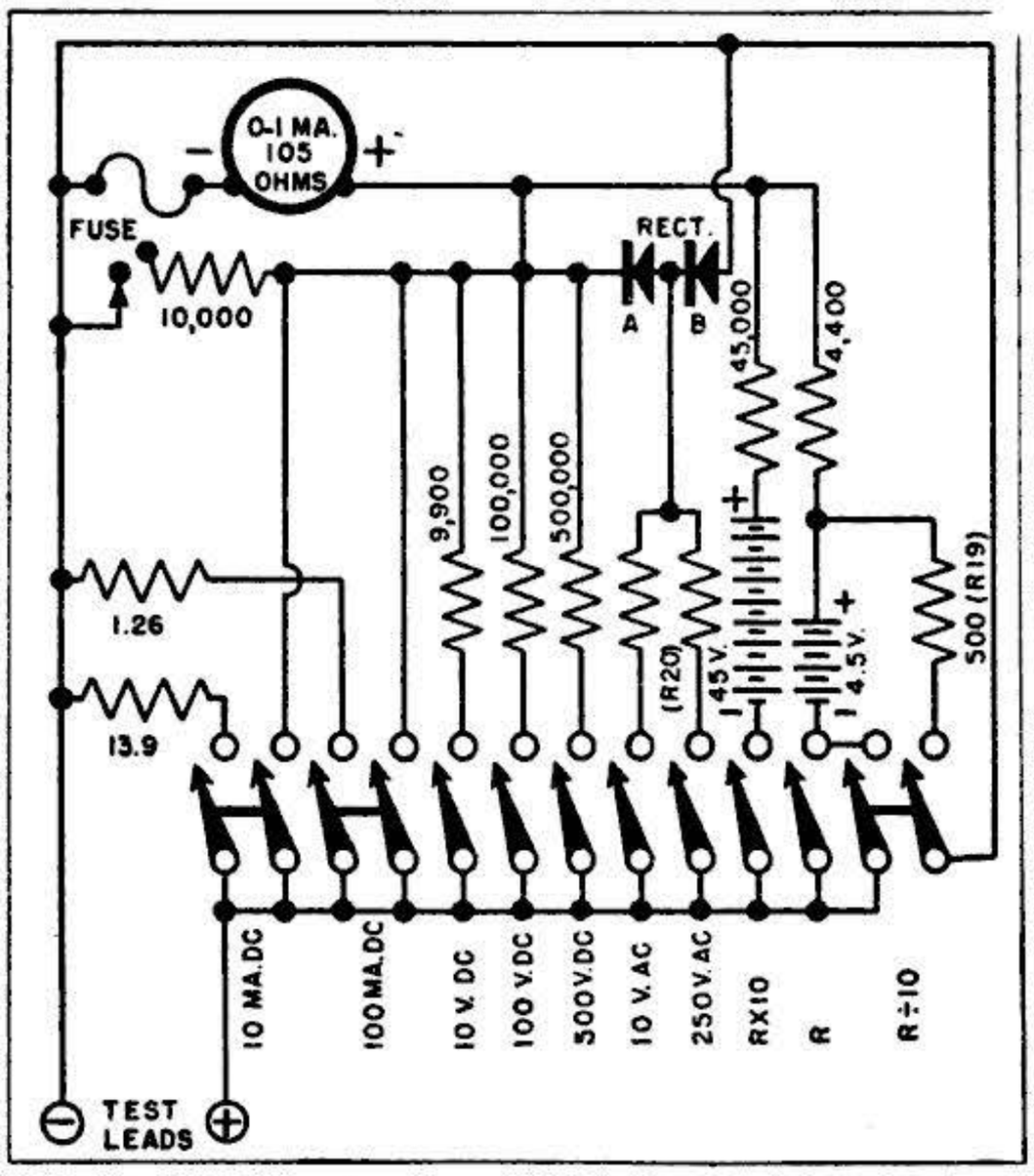
tion shown. Most meter manufacturers either stock meters of this description or will supply them on special order. For DC ranges, sensitivity is reduced to 1 ma. by means of shunt R1.

Alternating currents and voltages are rather elusive things to peg since their actual values are constantly changing. That quantity of AC that we mean when we say one ampere actually hits a *peak value* of 1.41 amp. both sides of zero. We call it one ampere because it has the same heating effect as that amount of DC. In other words, 1 amp. is its *effective value*, also known as *root-mean-square*, or *r.m.s.*

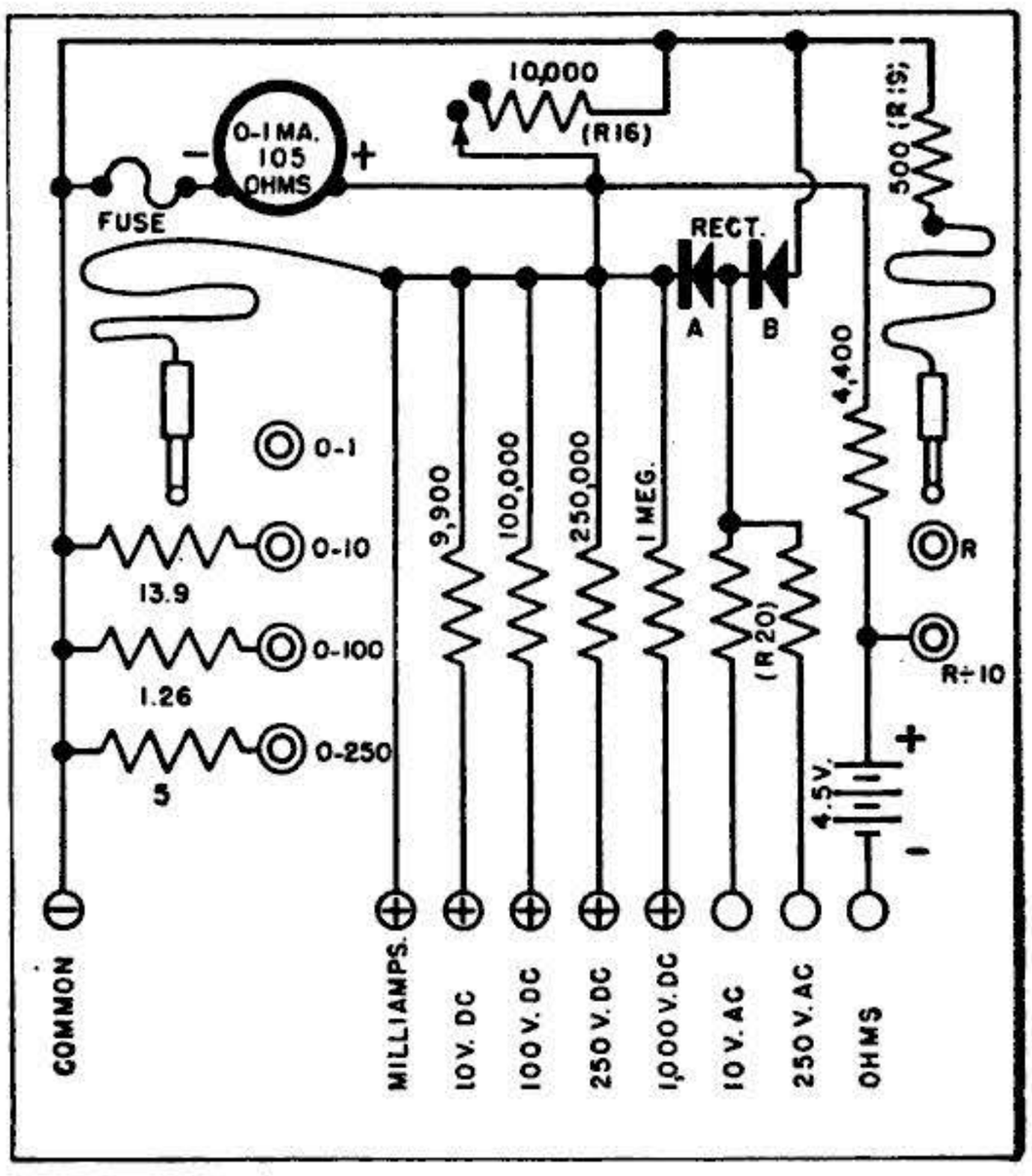
But that's not all. If an AC current of 1.41 ma. peak value is rectified and sent one way through a DC meter, we get a deflection of only .9 ma. This is the *average value* of the pulsating current. Hence, in order to get our meter to read full scale with 1 ma. of *r.m.s.* AC going through the rectifier, we want a meter with DC sensitivity of about .9 ma. Theoretically, .89 ma. will give greater accuracy because rectifiers are not in actual practice strictly undirectional in their conductivity.

All this applies only to a full-wave rectifier used with a .89 ma. meter as in our main diagram. The other schematics show half-wave rectifiers and 1-ma. movements. To compensate for the difference between

Copyrighted material



Pushbutton selector switches or individual toggles are used here to simplify switching.



For portability the high-ohms range has been omitted, doing away with the 45-volt battery.

average and r.m.s. values, the AC multipliers (R20 in both circuits shown above) are made smaller than the comparable DC multipliers. Using half-wave rectification, R20 will be approximately 445 ohms-per-volt (4,000 ohms for the 10-volt, and 110,000 ohms for the 250-volt scale). With a four-element full-wave rectifier these values are doubled. As a check on operation, apply known DC voltages across the AC terminals; the indication should be about 11 per cent too high.

As was noted in the previous installment, ohmmeters are usually peaked at center scale, common ranges being 45,000 ohms, 4,500 ohms and 450 ohms. Using a O-1 ma. meter, the former calls for a 45-volt battery and total series resistance of 45,000 ohms. For the second, both values are divided by ten. To divide again by ten in order to achieve the third range would seemingly call for a .45-volt battery. Since there is no reliable means for obtaining such a battery voltage, we must use a higher voltage and a higher full-scale current in order to maintain total series resistance of 450 ohms. Two methods of accomplishing this are shown in the diagrams.

In the one on page 206 the meter is shunted to read 10 ma. full scale. Note the jumper from the 10 ma. shunt, R2, to position 13 on selector switch S1. When S3 is closed, a current of 10 ma. flows from the 4.5-volt battery through R13 and the shunted meter. For measurements on the series-ohm ranges, R17 is set at zero and can therefore be disregarded.

The second method for obtaining the lowest series-ohms range requires the addition of just one resistor to the 4,500-ohm center-scale circuit. This is R19 in the two smaller diagrams; the 500-ohm unit shunts the 4,500-ohm resistance that is made up by adding 4,400 ohms to the approximately 100-ohm meter. Two things are accomplished by R19: the reduction of the total circuit resistance from 4,500 to 450 ohms, and the by-passing around the meter of nine-tenths of the resulting increased current.

If still lower ohms ranges are desired, the shunt ohmmeter is recommended in place of the series type. It is incorporated in the major diagram and will be discussed more fully in a forthcoming issue.

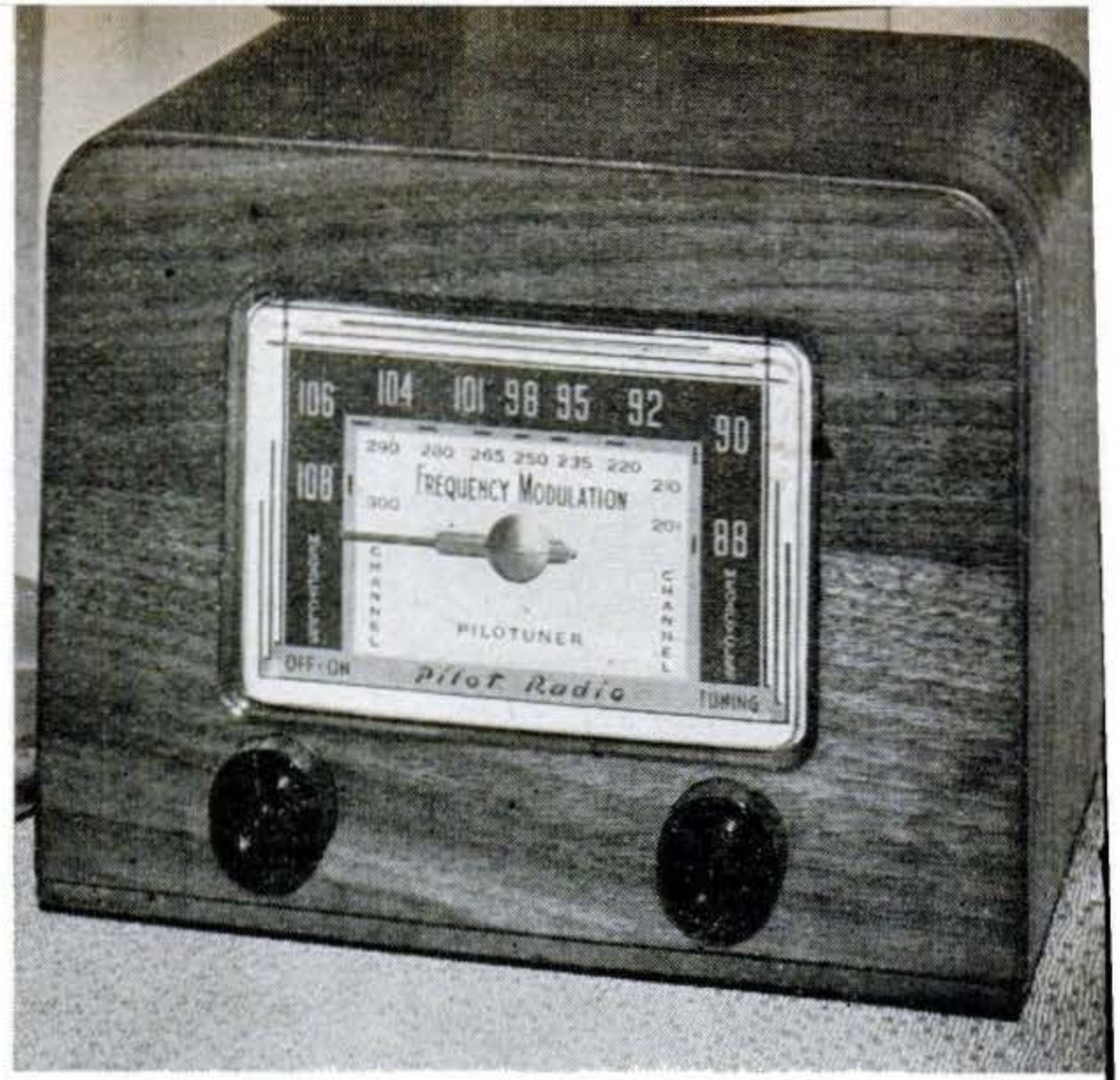
TO BE CONTINUED

COPPER WIRE TABLE

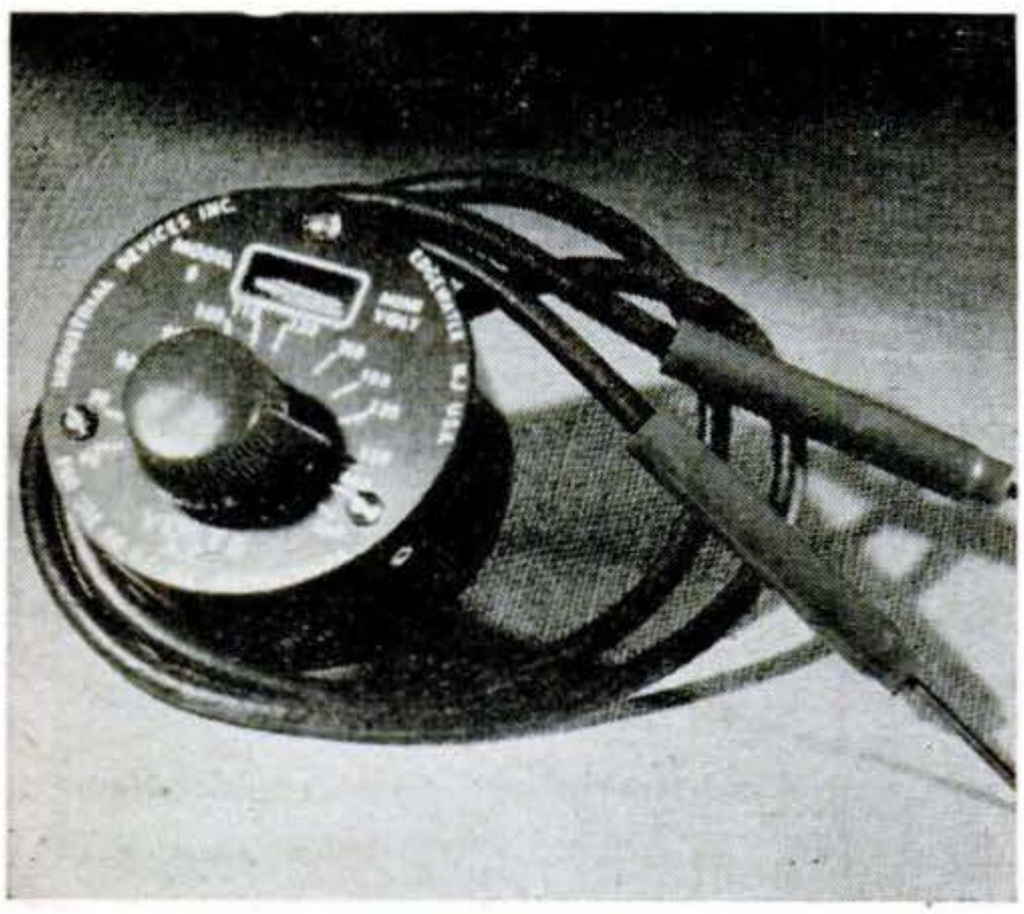
No. SIZE	OHMS PER FOOT 68°F	OHMS PER FOOT 77°F	MAXIMUM CURRENT MA.
22	.01615	.01646	1300
24	.02568	.02617	800
26	.04082	.04162	500
28	.0649	.06617	300
30	.1032	.1052	200
32	.1641	.1673	120
34	.2609	.266	80
36	.4148	.423	50
38	.6596	.6726	30
40	1.05	1.069	20

Copyrighted material

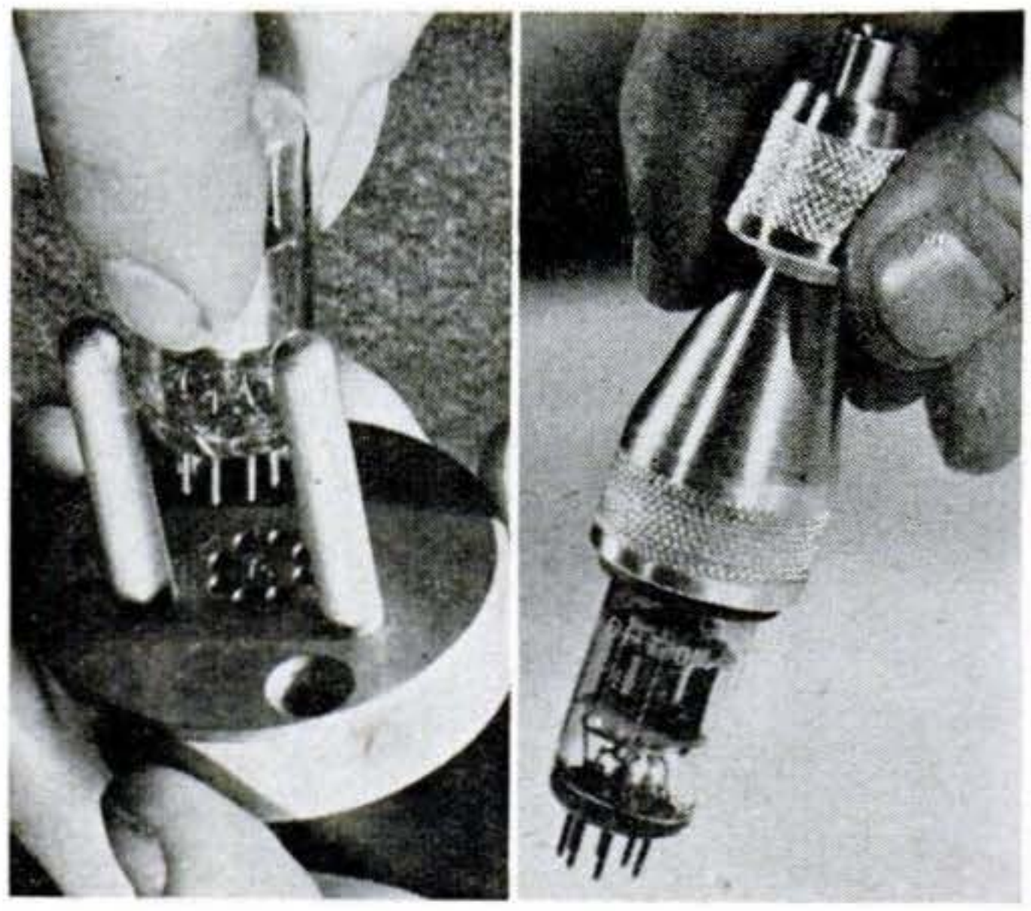
'Scope Tubes Plug in. Removing the light shield on the face of this new RCA oscilloscope permits quick interchange of the cathode-ray tube through the front panel. Tubes with different degrees of phosphor persistence may be switched in a matter of seconds, thus giving the single oscilloscope greater versatility.



Tuner Brings in FM. A low-priced adapter which is said to convert any radio or amplifier for reception on the new 88 to 108-mc. FM band is being mass-produced by Pilot Radio Corporation, Long Island City, N. Y. The unit sells for about $30. It contains its own power supply and a built-in FM antenna.



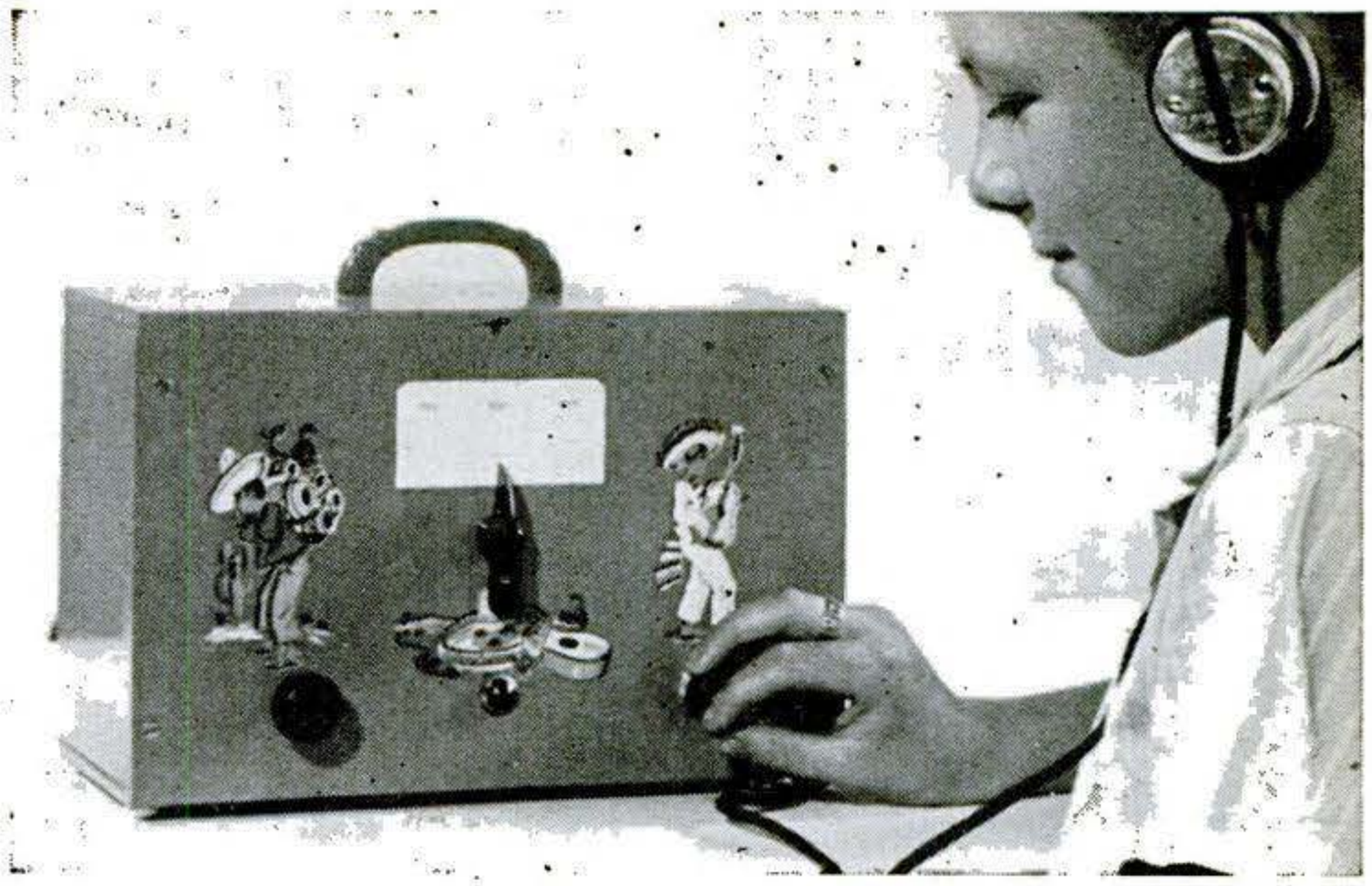
Neon Lamp Measures Voltages. AC or DC voltages from approximately 65 to 660 can be read directly on this miniature neon-glow meter. It is operated by turning the knob of the variable resistor until the neon glow is extinguished, whereupon the voltage is read directly on the scale. The tester, which is said to be accurate enough for most practical applications, is made by Industrial Devices, Inc., Edgewater, N. J. Bulb life is guaranteed for 10,000 hours of actual operation.



Tools Simplify Tube Handling. Two new devices will make miniature radio tubes easier to use. Because the fine-wire prongs of these tubes are so readily bent out of shape, it is often difficult to insert them properly in their sockets. The gadget shown at the left above solves this problem by aligning the prongs quickly and automatically. At the right is an extractor for hot or hard-to-reach tubes; the glass is gripped by a heat-resistant rubber cup inside the aluminum shaft.

Copyrighted material

Boy's Radio Lets Dad Enjoy His



By Clinton E. Clark

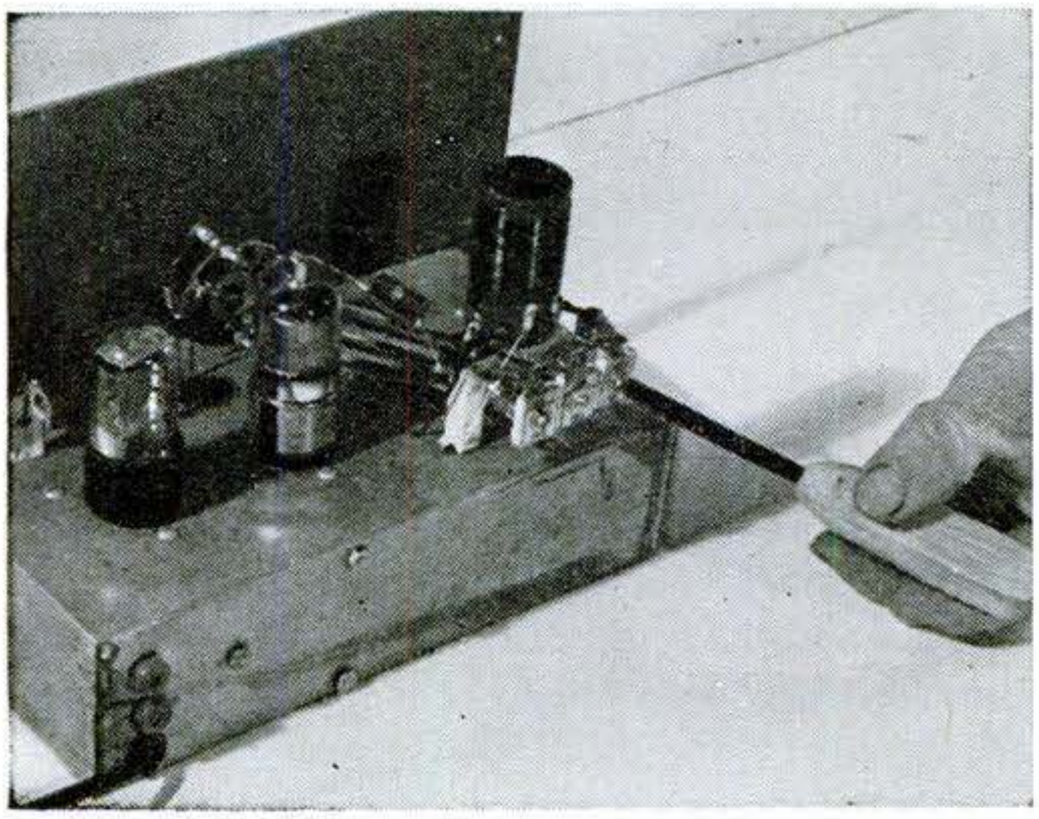
EVERYONE in the family will enjoy this little two-tube headphone set. Junior can listen to all the programs especially meant for him, and Pop and Mom will escape the nerve-shattering tommy guns and thundering herds. Pretuning makes things easy, for any young listener can turn on the switch and set the pointer knob to his choice of three stations. A four-position switch and one extra trimmer would adapt the set to cover all four major networks. Although the circuit is regenerative, pretuning eliminates the usual squeals.

Begin work on the chassis by drilling or punching two 1⅛″ holes for the tube sockets. Then drill holes for mounting the line-dropping resistor 1″ in front of the 12J5GT tube. This resistor must be above the chassis because it creates considerable heat.

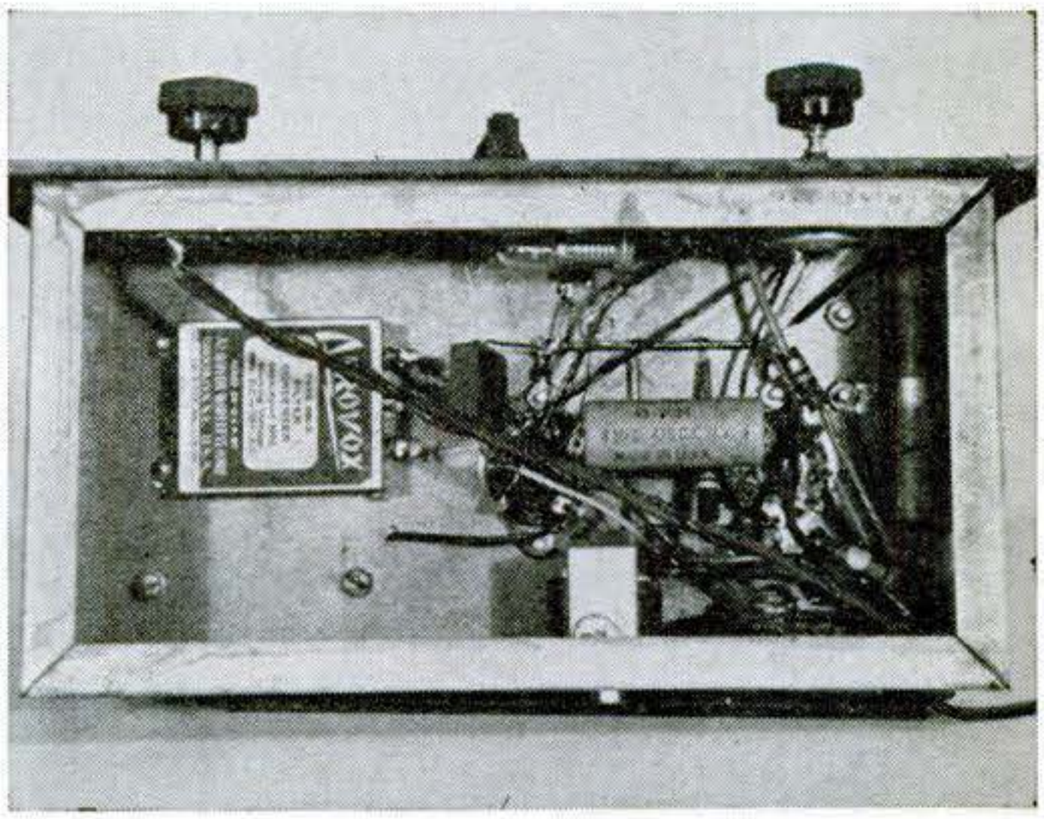
In the back of the chassis, drill three holes for the phone jacks and line cord, protecting the latter with a rubber grommet. In the front, drill three evenly spaced holes for the switch, pilot light, and regeneration control. Drill three corresponding holes in the panel, plus a fourth for the selector switch.

After the sockets, filter choke, and selenium rectifier have been mounted, the subchassis wiring may be started, taking the power-supply section first. If you have a meter, the DC voltage here should test approximately 100. Then install the filament circuit, and determine the 580-ohm setting of the adjustable slide with an ohm meter.

Mount two 1½″ high standoff insulators 2″ apart on the left rear of the chassis top. These support the coil and tuning capacitors, a soldering lug being used on the top of each to attach a length of stiff wire to which the condensers are soldered. The other ends of the condensers are brought to



Pretune the set with a neutralizing tool or a bakelite shaft ground to a screwdriver tip.

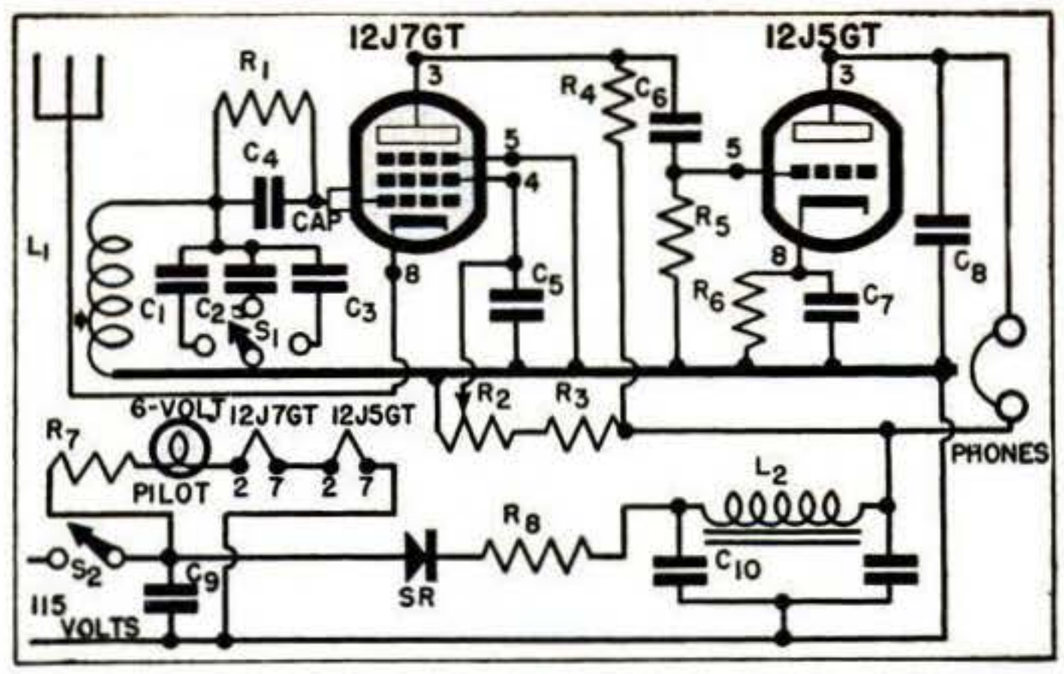


Subchassis wiring is comparatively simple. Test the various sections as you go along.

Copyrighted material

their respective positions on the tap switch. For this receiver, the coil is the type commonly used on small TRF sets, the winding being a single layer. Remove the primary winding entirely.

Experimentation generally will show that the best position for making the cathode connection is near the bottom or ground end of the coil. To locate the exact position, probe with a needle or pin stuck into the eraser on the end of a pencil until you find where regeneration control R2 operates smoothly. Then make a soldered connection. To adjust the tuning condensers, use a serviceman's neutralizing tool, or, lacking

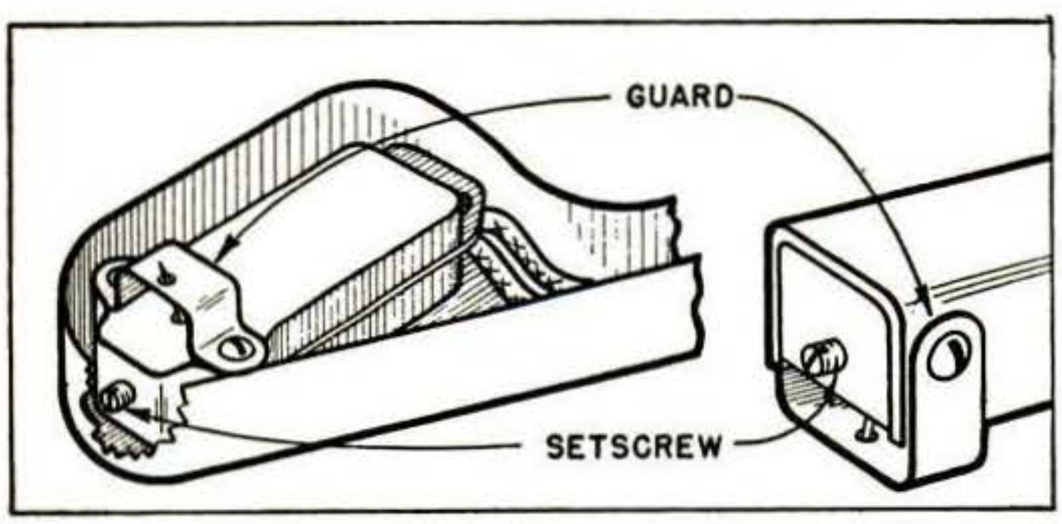


this, a 4″ length of bakelite shafting ground to a screwdriver tip. An outside antenna is desirable but not absolutely necessary.

LIST OF PARTS

L1: TRF coil.
L2: 10-hy., 50-ma. choke.
C1, C2, C3: 400-mmf. trimmers.
C4: .0001 mfd. mica.
C5: 1 mfd.
C6, C9: .01 mfd.
C7: 4 mfd.
C8: .005 mfd.
C10: dual 20-20-mfd., 150-volt, electrolytic.
R1: 5 meg.
R2: 50,000-ohm pot.
R3: 100,000 ohms.
R4, R5: 250,000 ohms.
R6: 2,000 ohms.
R7: 600-ohm wire-wound, 20-watts; adjustable to 580 ohms.
R8: 100 ohms.
SR: 75-ma. selenium rectifier.
S1: Single-pole, 3-position selector switch.
S2: SPST rotary switch.

Simple Guard Protects Needle

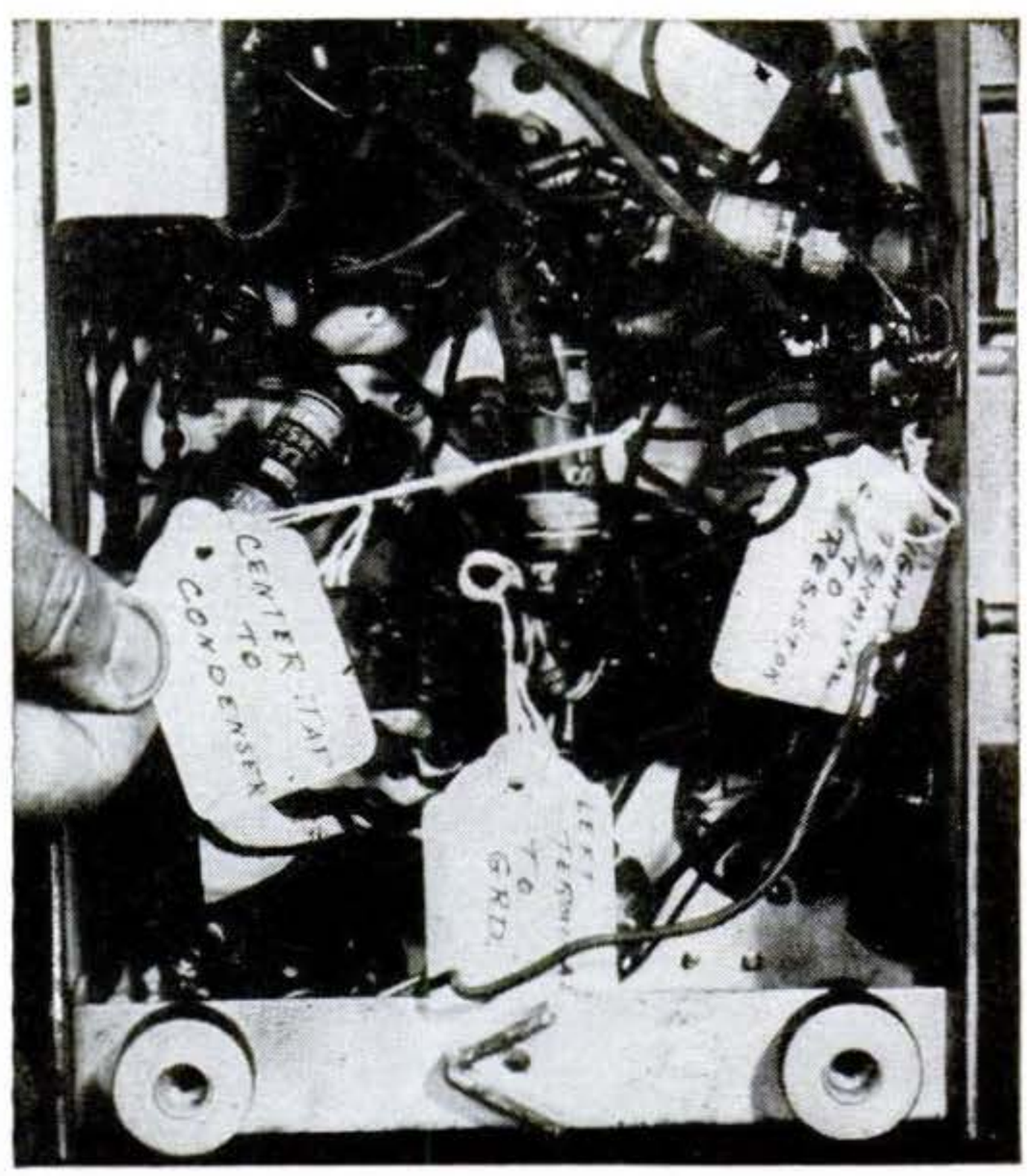


PHYSICAL abuse is a frequent cause of crystal-pickup failure. This may be avoided by installing a permanent-needle type of cartridge with a guard or by building a guard for your present pickup.

An effective guard may be made from a ½″ by 1¼″ strip of shim brass .005″ thick. Drill a ⅛″ hole in the center for the needle. Then bend the ends of the strip upward parallel to the needle, and finally, if the arm is the type at the left above, outward so that the ends may be fastened to the bolts that hold the cartridge in place. Drill holes to suit these bolts. Form the guard so the needle projects about 1/16″.

Install a jeweled or other permanent needle and replace the thumbscrew with a setscrew. The arm need not be rebalanced as the weight of the brass strip is not sufficient to warrant it.—MAX ALTH.

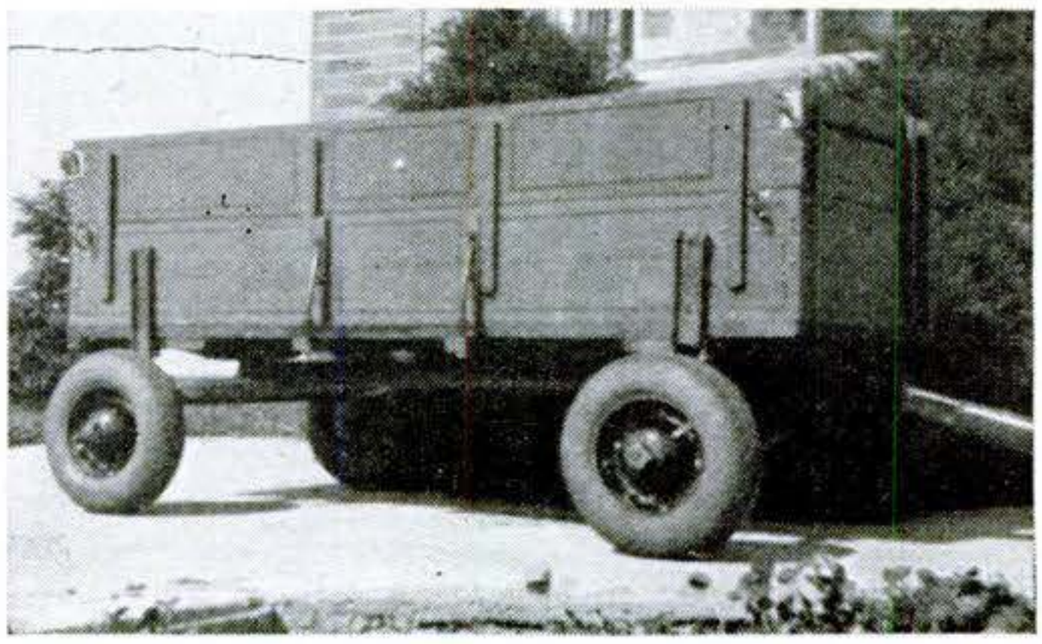
Tagging Wires Saves Time

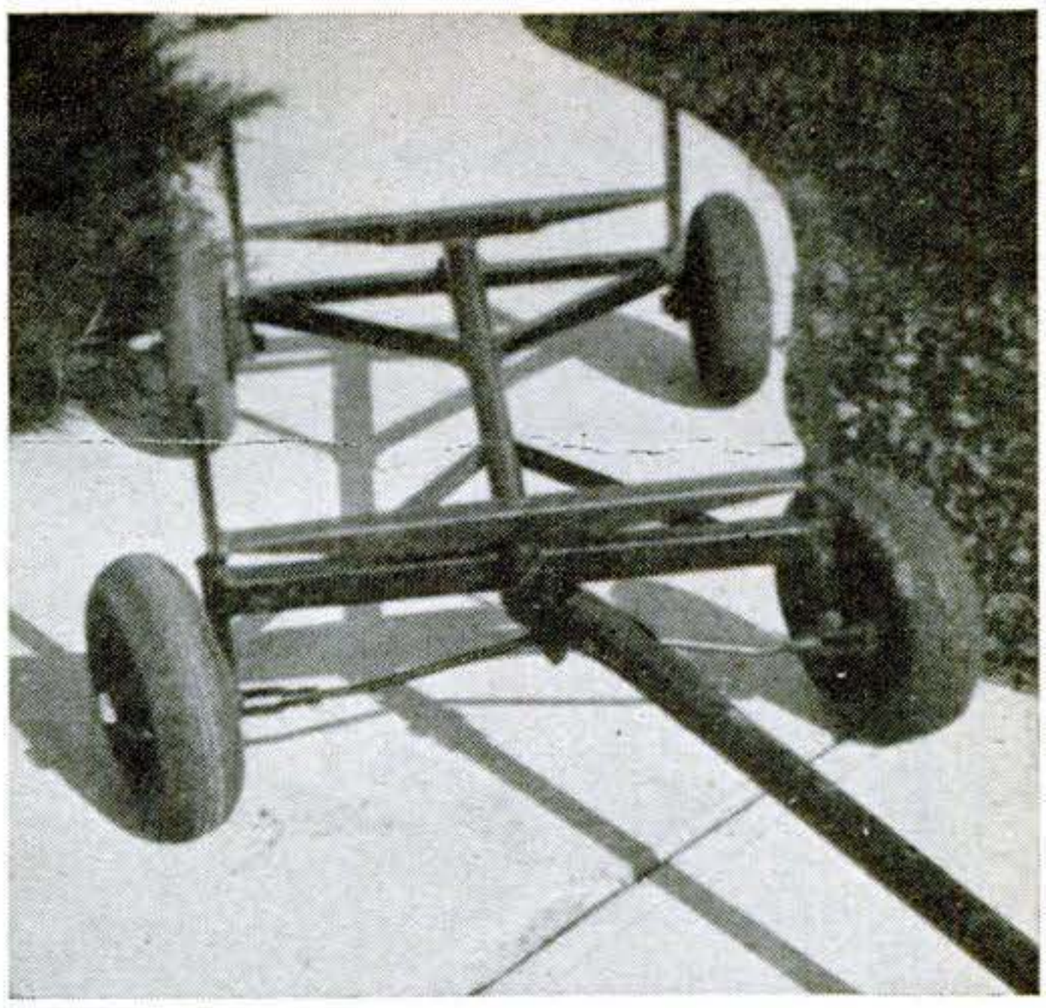


CONSIDERABLE time may be saved and possible errors eliminated by using price tags to mark the wires when making replacement of radio parts. During reassembly, the tags will show exactly where each wire goes. By erasing the pencil marks, the tags may be used many times. Such tags are available at office supply stores.

Copyrighted material

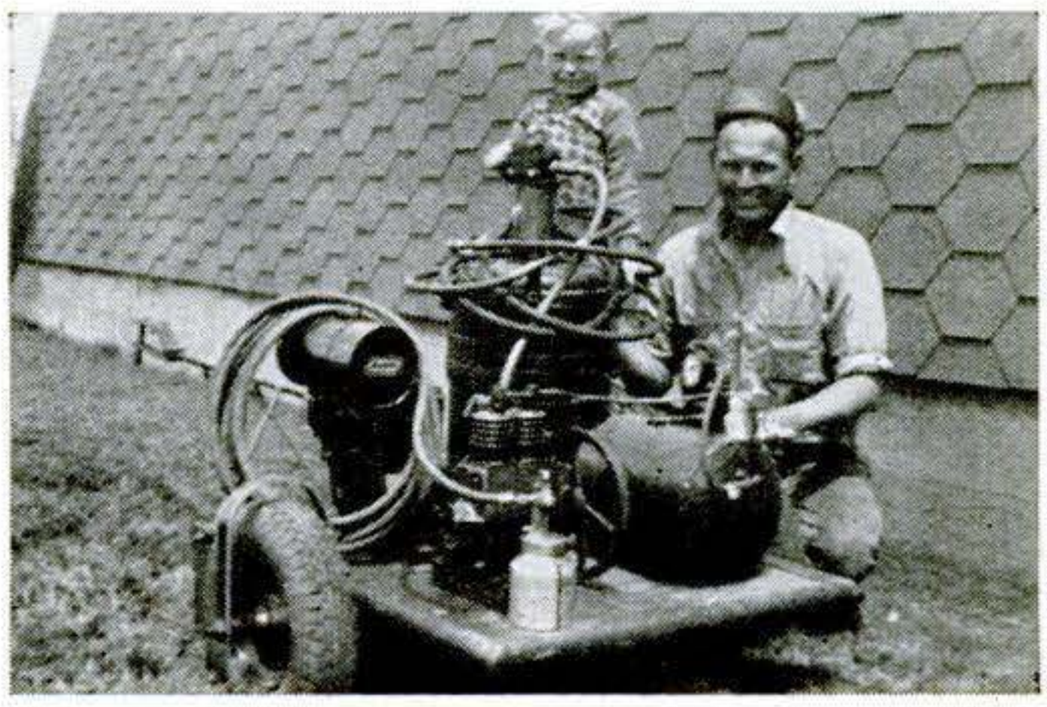
CRAFTSMEN at WORK

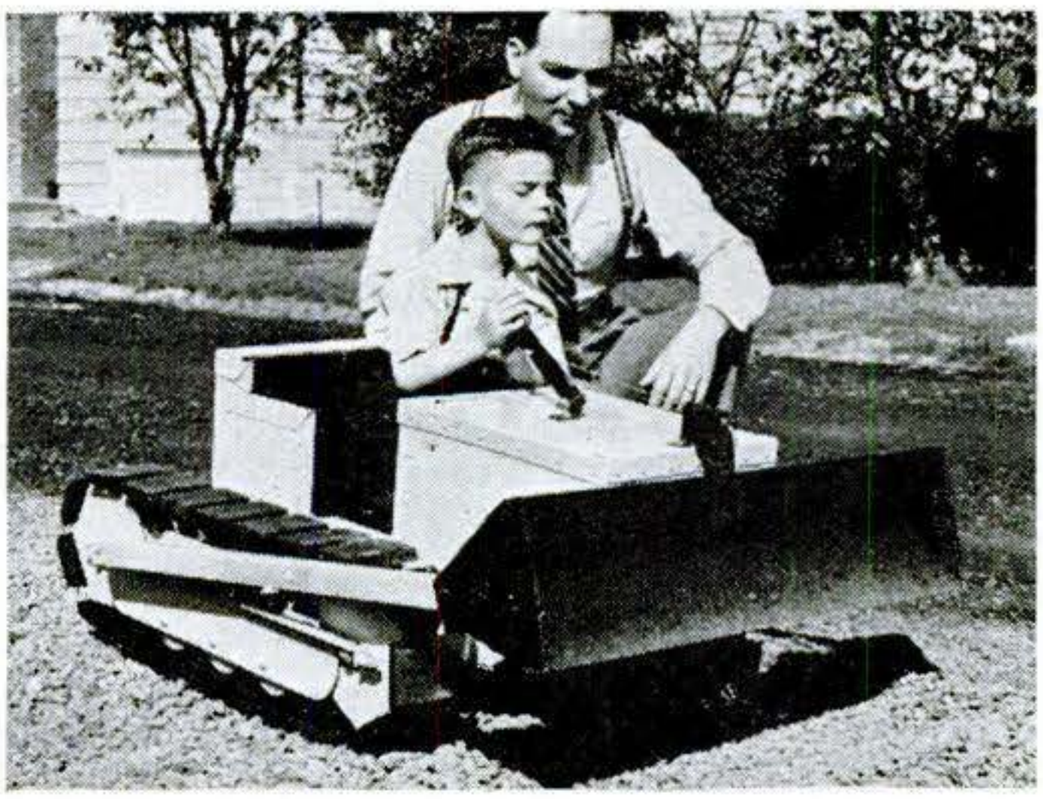




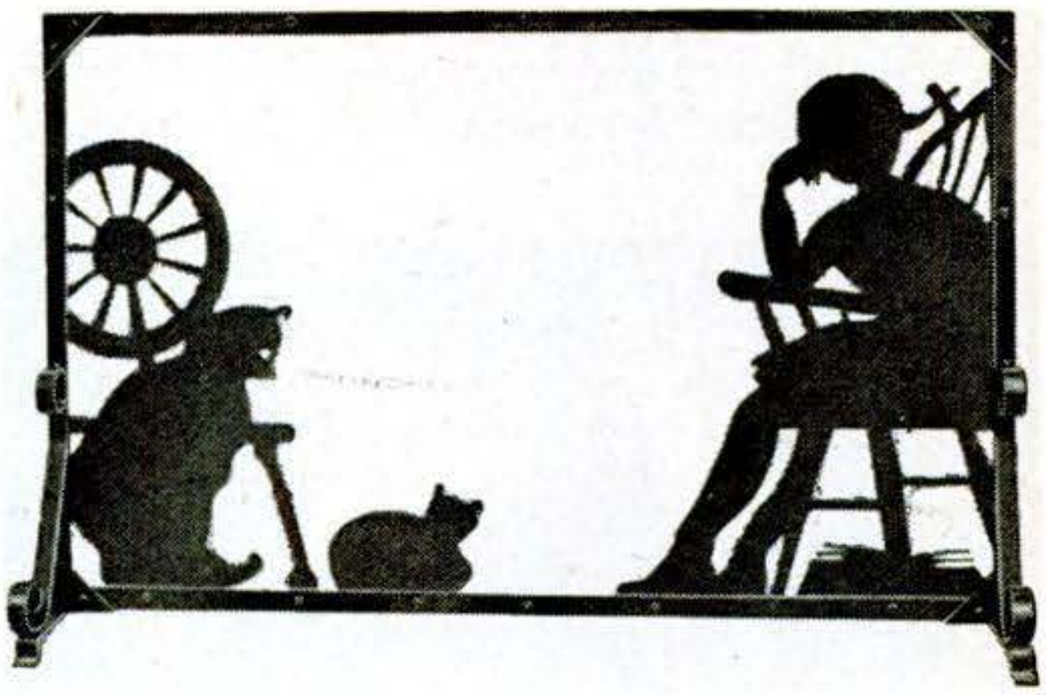
Wagon Like Dad's. This coaster wagon, built by A. R. Barringer, of Ruthven, Iowa, for his children, is patterned after an actual farm trailer. Aside from a few bolts, the running gear was made from pieces of scrap iron. Radius rods cut from a model T Ford serve the same purpose on the wagon. The reach is adjustable as to length. Tie rods link the handle to the wheels. These and bearings were purchased.

Spray Outfit Is Portable. Mounted on a frame of 1¾" welded pipe fitted to two wheelbarrow wheels, this spray and grease outfit may be pulled anywhere behind a tractor, car, or truck. It sprays paint, pressure-lubricates farm machinery, and fills tires. Built by Joseph E. Brassal, Jr., of Lockport, Ill., it includes an old street-car compressor of 3.2 cu. ft. capacity operated by a 1½-hp. gasoline engine by a belt drive, a 150-lb. pressure tank, a grease can of 60-lb. capacity, and a spray gun.





Shoving Things Around. This miniature bulldozer was built by Jack Cromer, of Seattle, Wash. A control on the hood raises or lowers the blade. Inside controls operate the tracks, allowing them to be used in unison or separately for turning.



Screen Built from PSM Plans. This screen was made by Walter J. Stanton, of Norfolk, Va., from plans published in *Popular Science Monthly* (Nov. '44, p. 178), dimensions being suited to his fireplace. The silhouettes were cut from 25-gauge sheet metal. Black heat-resistant enamel was applied to the screen.

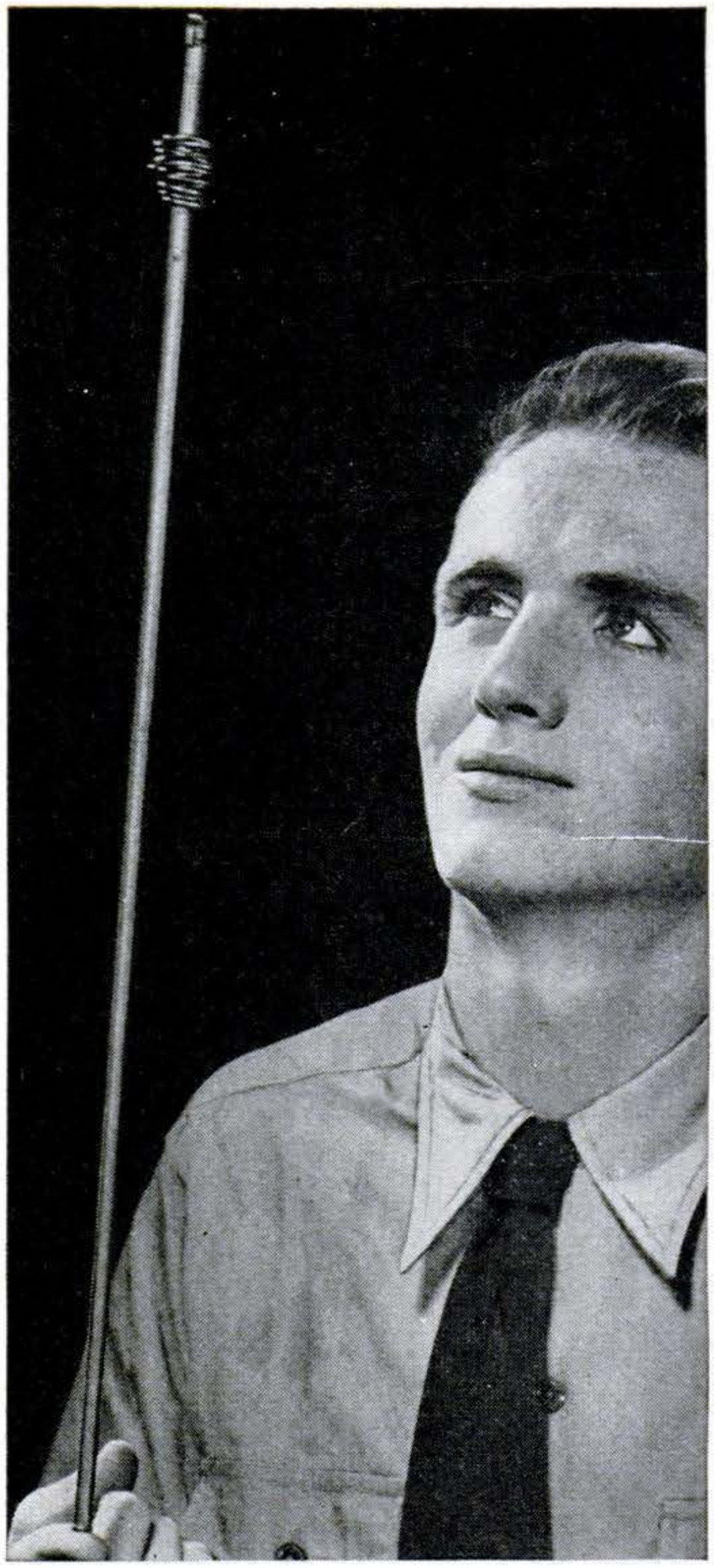
Copyrighted material

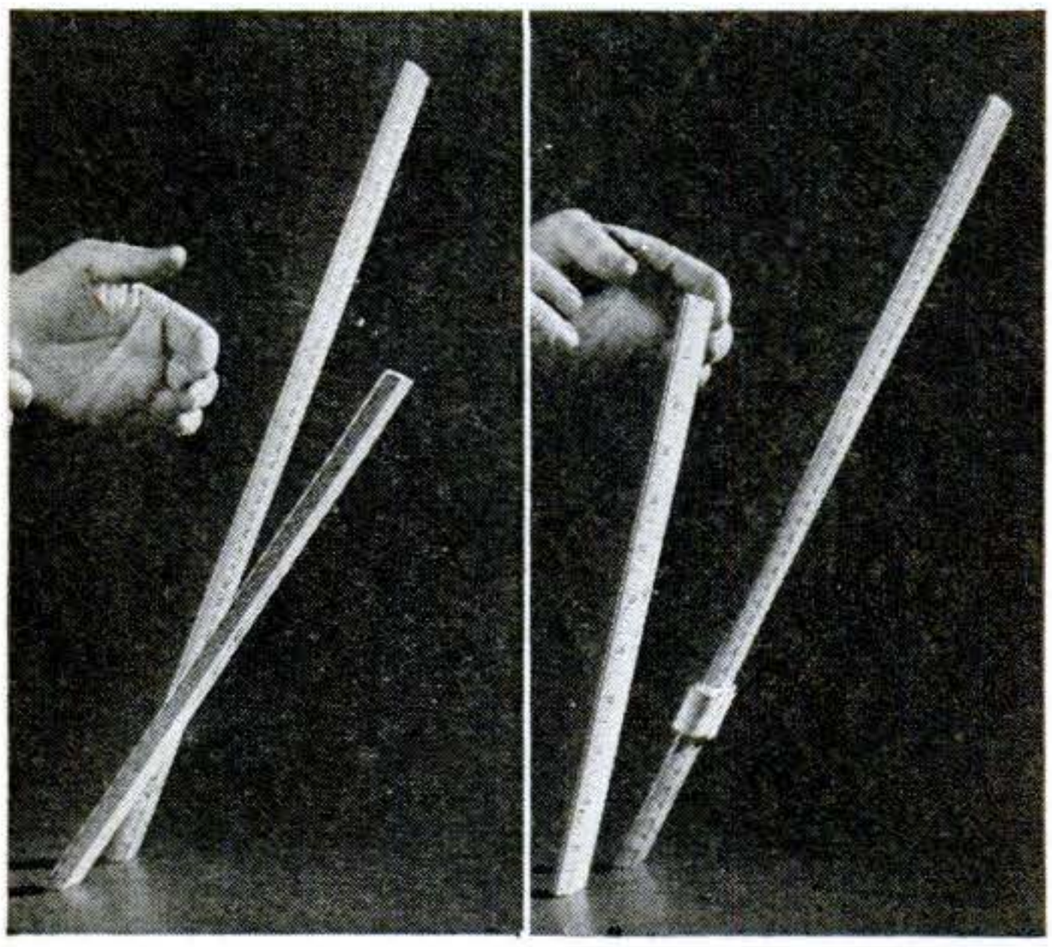
HOME EXPERIMENTS

How and Why Things Balance

Center of Oscillation. If you weight a curtain rod by winding wire around it near one end, will it be easier to balance vertically with the weighted end at the top or at the bottom? If you say the bottom, you are wrong. Although it is true that an object is more stable when its center of gravity is near the bottom, another factor comes into play in this case.

Because the base is so small, the object so tall, and the support so unsteady, the rod will fall no matter which end is up. By putting the weight near the top, you shift the *center of oscillation* toward the top. This is the point on the rod that falls as if it were a free-falling body. Thus, if the weight is near the bottom, the rod will fall quickly. But if the center of oscillation is near the top, the rod will require longer to fall. It is therefore easier to balance the curtain rod with the weight at the top because you have more time in which to check the fall when the rod begins to topple over.



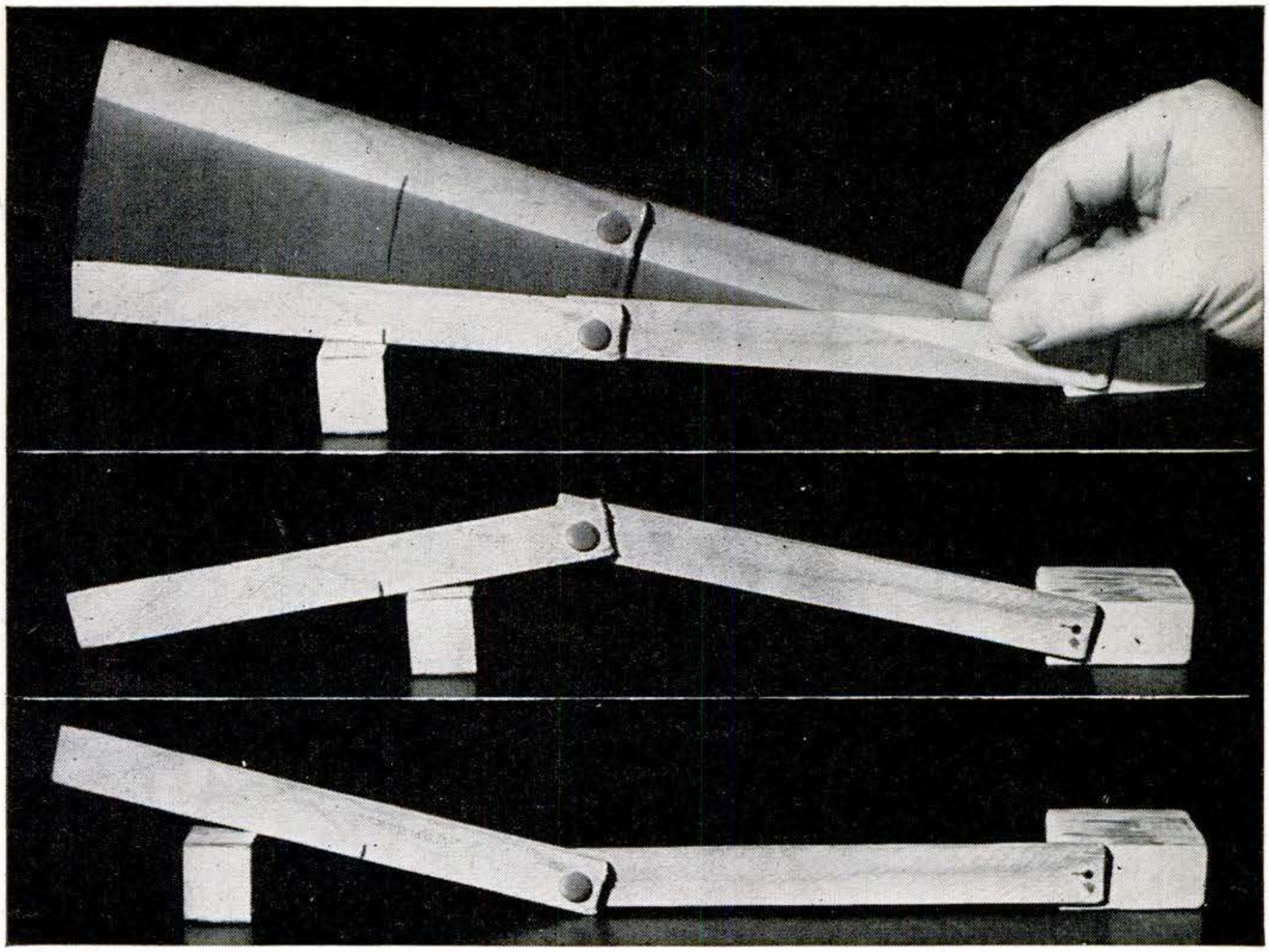


Fall Varies with Height. There's a scientific reason for the fact that a child is more apt to fall when he trips than is a tall man. Because the man's center of oscillation is higher, he must fall farther. Hence, he has more time to catch himself.

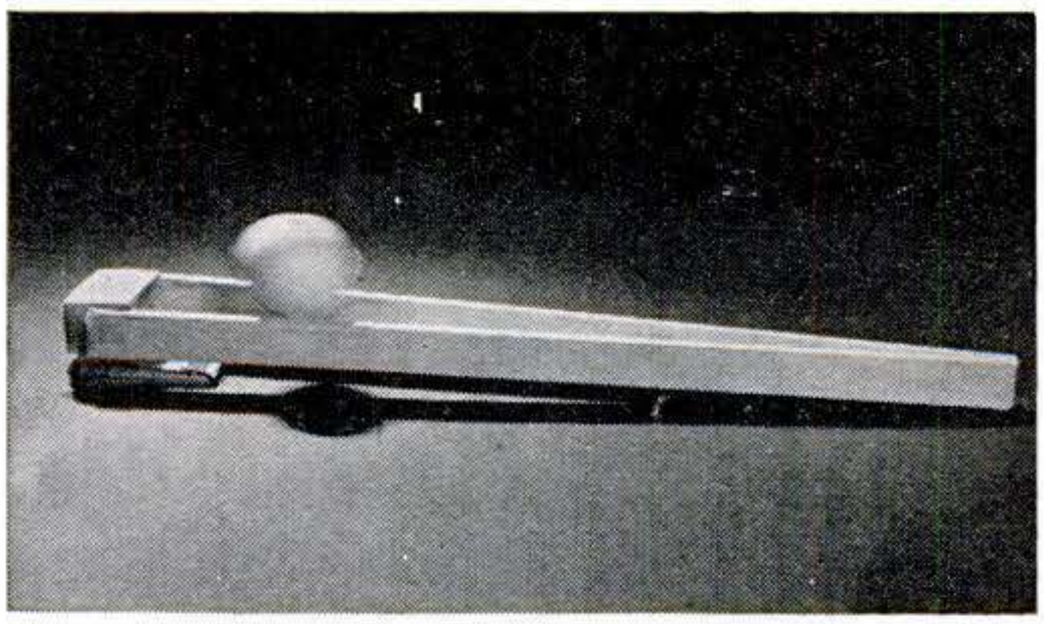
You may demonstrate that the time required for objects to fall depends upon their height by letting two rulers of different length fall at the same time. If both are of uniform cross section, the shorter will reach the table first, as at the far left.

But if the center of oscillation of the longer is shifted to the bottom by weighting it, as in the other photo, it will fall as if it were the shorter ruler.

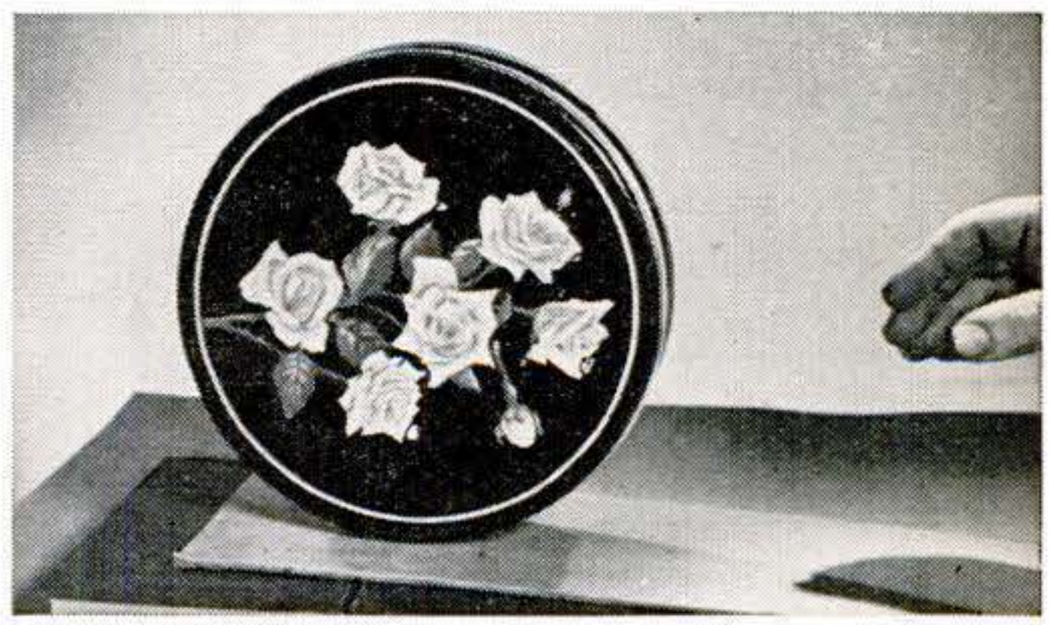
Copyrighted material



Center of Percussion. In a uniform unweighted rod, the center of oscillation is about two-thirds the distance from the point of support. This center is also the *center of percussion*—the point at which, if struck, the rod will not transmit vibration to the support. You may demonstrate this, as at the top, with a stick pivoted in the middle and at one end, the center pivot being just firm enough to keep the outer half from dropping under its own weight. If you let this compound stick fall so it strikes a block two-thirds of the way from the end pivot, the joint will remain perfectly straight. However, if the block is shifted inward or outward away from the center of percussion, the impact will cause it to buckle in the center, as in the lower photos.



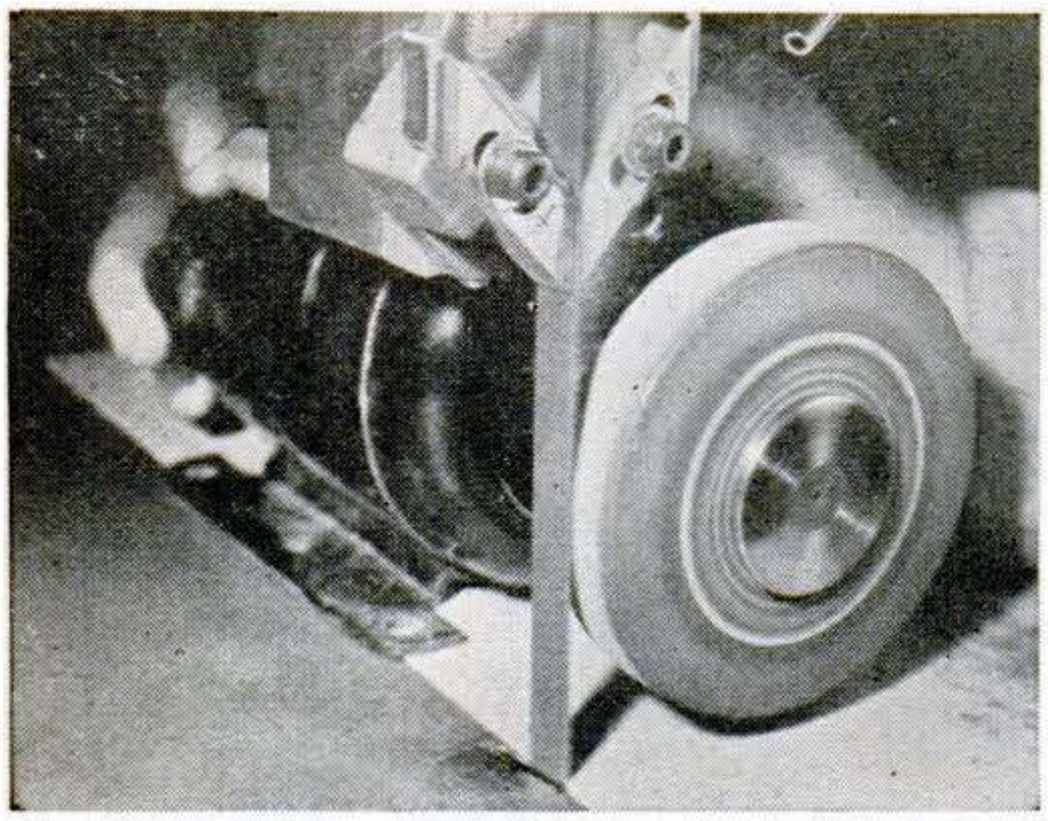
Ball Rolls Uphill. Because an object in unstable equilibrium constantly tries to lower its center of gravity, the ball above seems to roll uphill. The wide end of the V-shaped track is higher than the other. Placed at the narrow end, the ball rolls toward the higher because the spreading track allows it to lower its center of gravity.



Uphill or Down. A lead weight attached inside this box makes it roll either uphill or down—just as you choose. Secretly note where the weight is in relation to the design. To roll the box uphill, put it down with the weight on top slightly on the uphill side. Keep the incline short so the box rolls only until the weight reaches bottom.

Copyrighted material

Knife-Edge Bandsaw Blade Cuts Rubber and Cork



VARIOUS uses may be found for a discarded bandsaw blade ground to a knife edge. It is particularly good for cutting such materials as sponge rubber and cork.

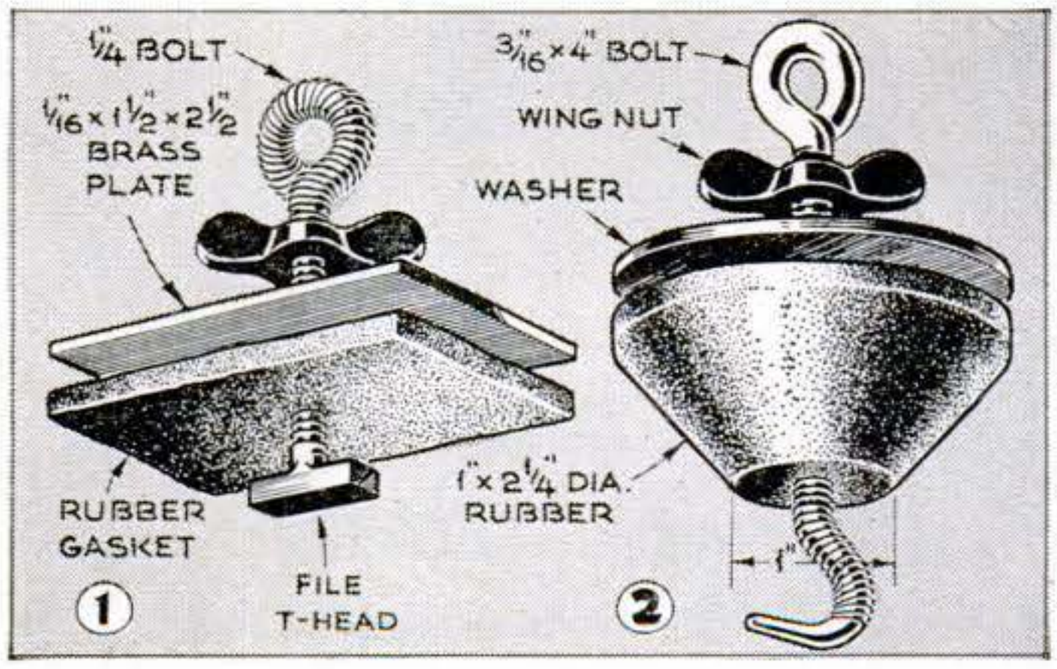
For grinding, mount the blade on the saw, taking care that it is adequately tensioned and tracks properly. Any grinding wheel from ¾″ to 1″ wide that can be set on the table will do. Mount it to grind a bevel of approximately 10 deg. on each side of the blade. During the grinding, run the blade at a velocity of 500 to 600 feet per minute. After grinding, make a few passes with a fine oilstone.

Two Special Gadgets Ease a Plumber's Work

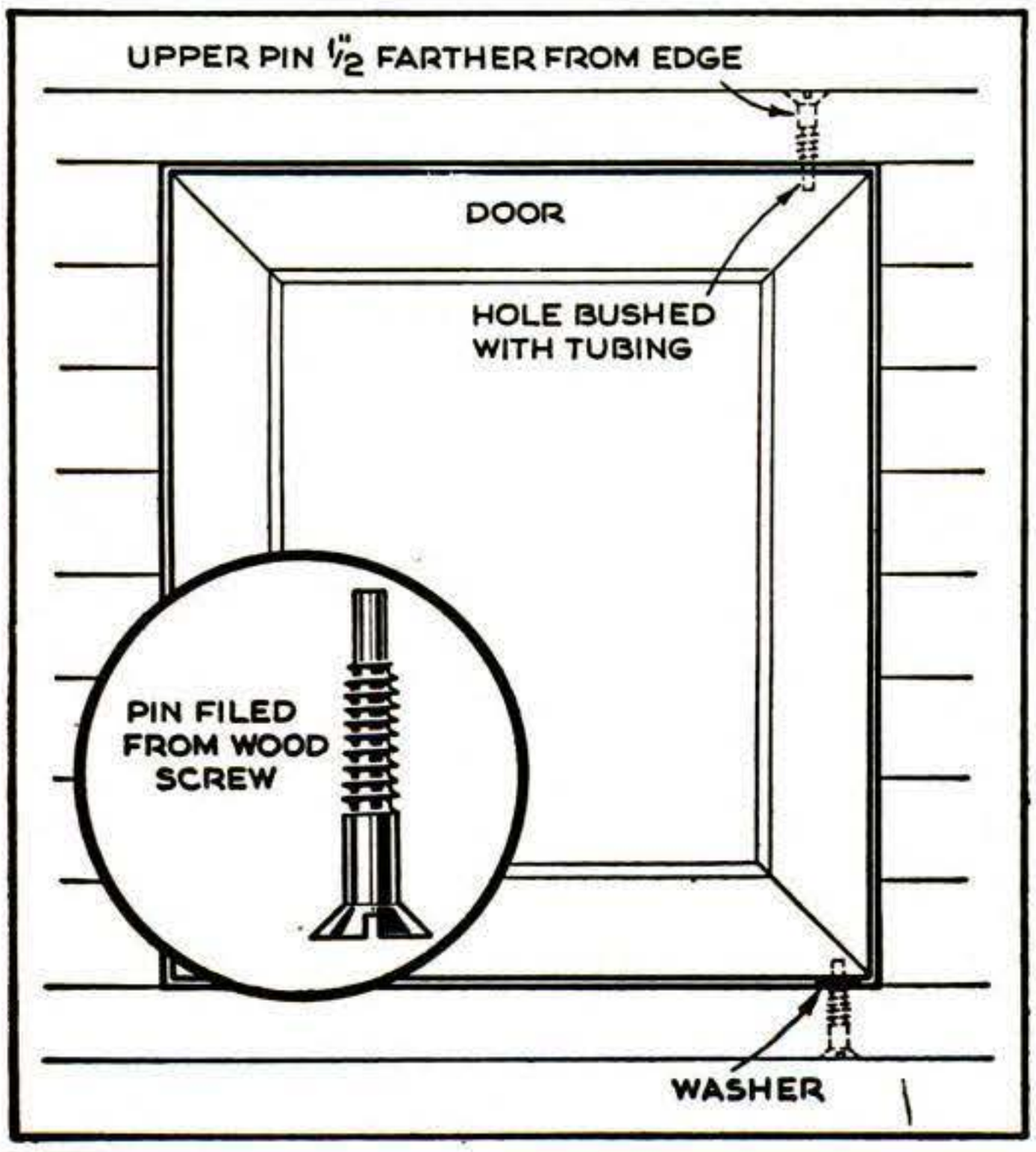
HERE are two homemade gadgets that I have used for many years in my work as a plumber. They should also prove useful around the home when the need arises.

The first is a basin overflow stop. When it is desired to use a plunger pump to clear a drain, the T-head of the bolt is inserted in the overflow opening, given a quarter turn, and the wing nut is then screwed against the brass plate. The gasket thus seals the opening, and the plunger can produce effective suction.

Where there is more than one drain outlet, as in a double washtub, the second gadget comes into use. The hook is engaged under the crossbar in one drain outlet and the wing nut is screwed down. With this outlet sealed, it is then possible to pump out the drain by using a plunger on the other outlet.—H. A. BARBIER, SR.



Swinging Door on Dog House Always Closes Again



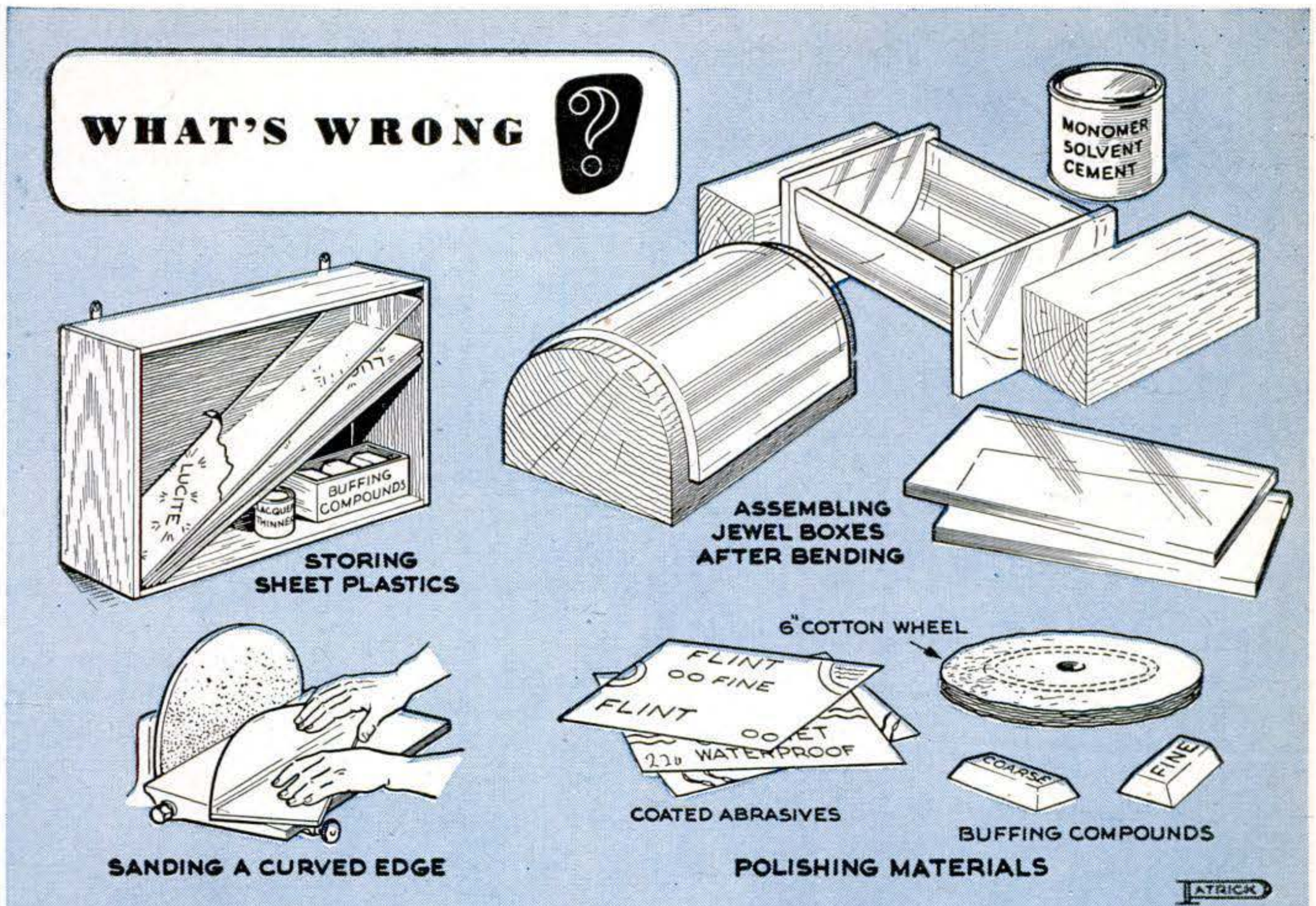
THERE are no springs on this small swinging door for a dog house, yet it always returns to the closed position after the dog passes in or out.

The secret lies in the fact that the upper pin is ½″ farther from the edge of the door than the lower pin. Bush the holes that receive the pins with metal tubing to prevent wear.—H. F. HAGELSTON.

Suction Cups Prevent Tipping

SUCTION cups screwed to small pieces of wood that are glued to the bottom of a dish will prevent a small child from tipping it. A knife edge releases the cups.

Copyrighted material



PLASTICS require procedures quite unlike those used for other materials employed by craftsmen. How many mistakes can you spot here? There are three in storing, three in assembling, one in sanding, two in polishing. Check with the answers printed upside down below.

Answers

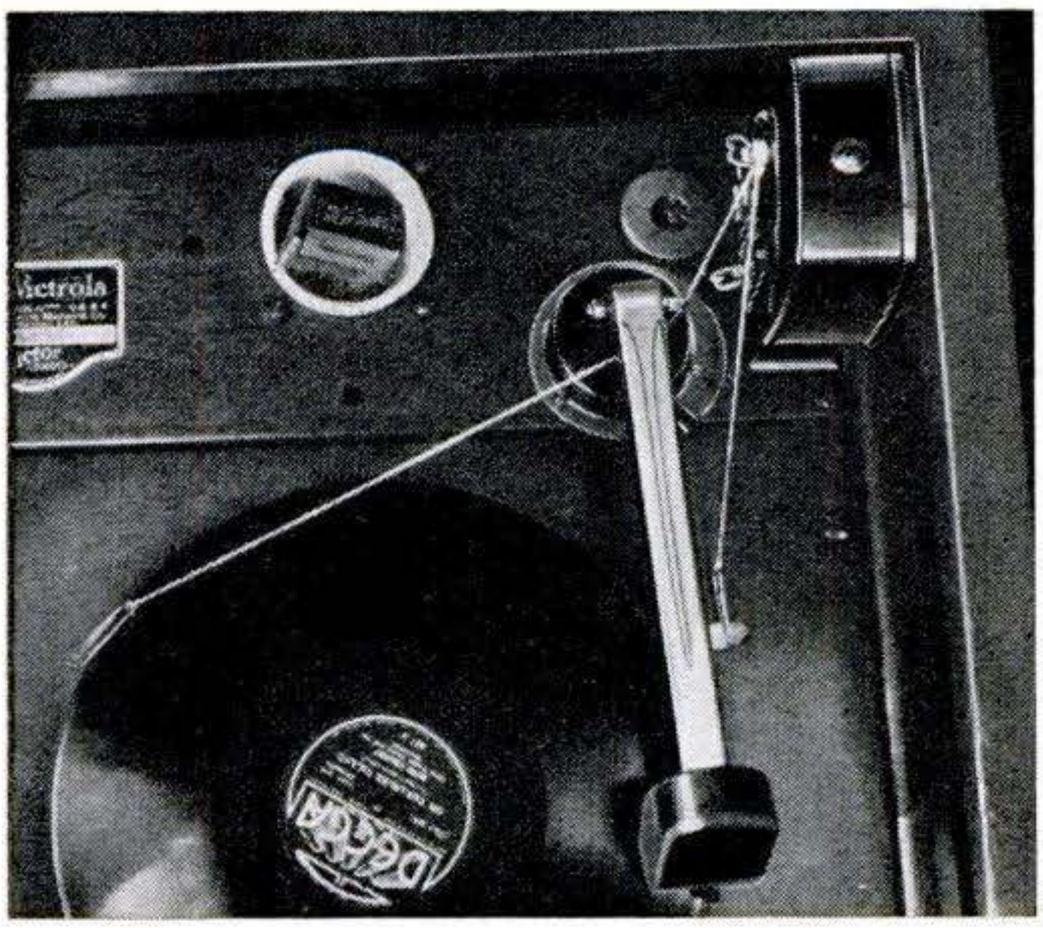
STORAGE: Sheet plastic should be stored either flat or on edge; as shown, it will take on a curve. Masking should be left on—even while plastic is worked in some operations. Plastics should not be kept where lacquer or solvent fumes may attack them.

ASSEMBLY: Bending deforms the edges of plastic, and they should be sanded square before cementing to a flat piece. Trim the mask from flat pieces only where the joint is to be made; leave the rest to prevent the cement from creeping. Use clamps to hold joints together until the cement sets.

SANDING: Masking paper should be left on to prevent abrasion of the surface.

POLISHING: The coated abrasives are too coarse; finish-sanding grits should be first 320, then 400, followed by wheel buffing. One buffing wheel is not enough; each grade of buffing compound should have its own.

Phonograph Alarm Wakes Sleeper Up to Music

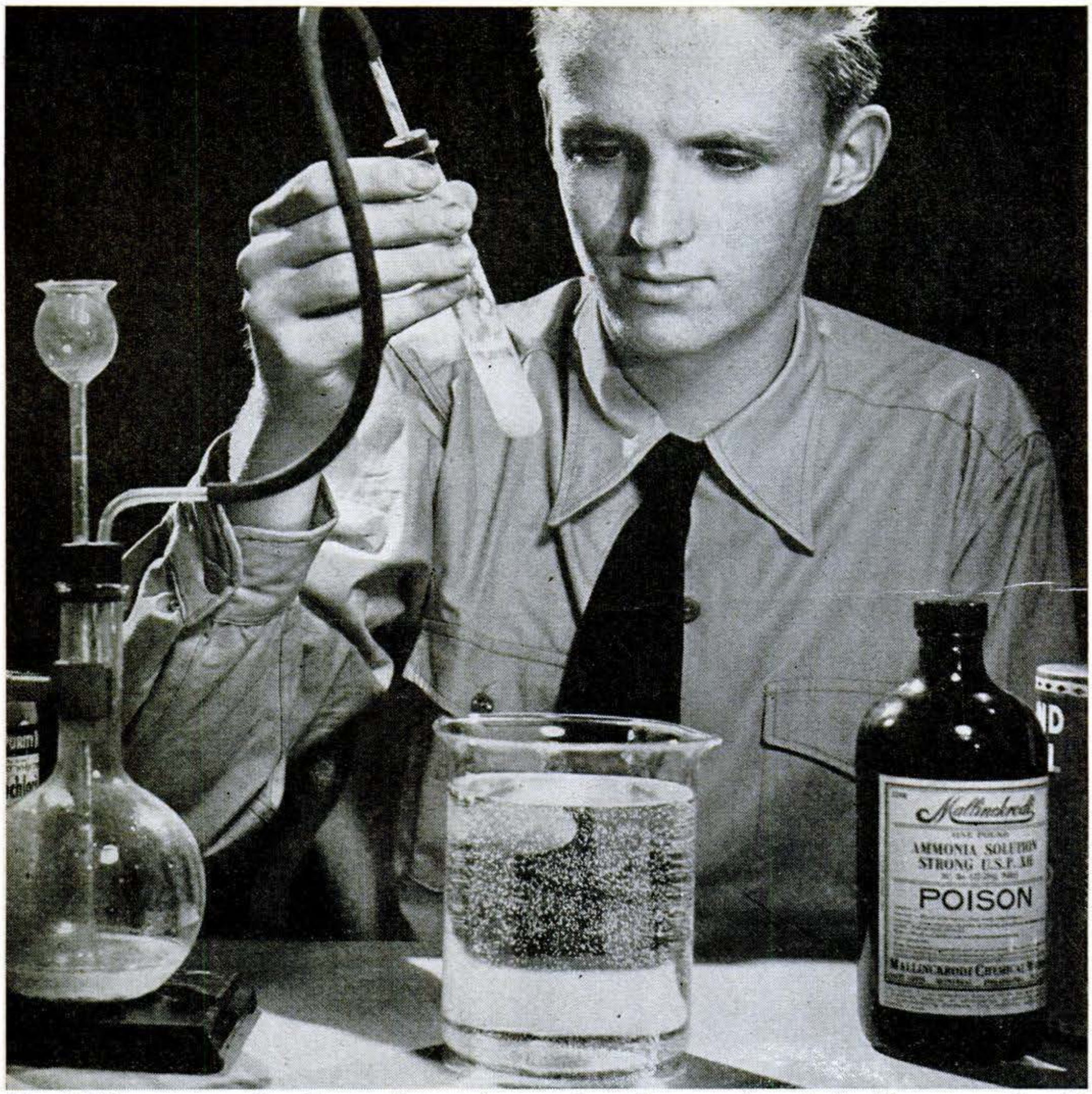


MUSIC has charms to soothe the savage breast—particularly in the morning. Hence, I start my day with a soothing melody.

Each night, I wind my phonograph and rest the tone arm on a favorite record. Then I slip a sewing needle under the felt of the turntable, slip over it a paper clip tied to a piece of string, tie the string to the wind key of a silenced alarm clock, tie a second clip to another string, slip it over the starting lever, and tie this string also to the wind key.

In the morning when the alarm key unwinds, the starting lever is released, and the other string gives a tug to help start the turntable.—G. E. HARRINGTON.

Copyrighted material



The Solvay process of making sodium carbonate may be demonstrated by leading carbon dioxide to a test tube containing a strong solution of ammonium hydroxide saturated with table salt. Sodium bicarbonate precipitates in the tube. Heated, this changes to the carbonate.

Sodium Carbonate Earns Its Salt

By Kenneth M. Swezey

NEXT to sodium chloride (common table salt), sodium carbonate is the most widely used of all sodium compounds. More than 1,500,000 tons are consumed yearly in the United States as the starting point for compounding other sodium chemicals. An equal amount is used each year to make glass, soap, cleaning compounds, paper, and leather, to soften water, and to help refine oil. Common washing soda is a crystallized form consisting of 10 molecules of water to 1 of carbonate.

Crude sodium carbonate is called "soda ash" because until about the end of the 18th Century it was made entirely by burning seaweed. Obtained from that source, the

Copyrighted material

chemical naturally was expensive—as were the glass, soap, and other products made from it. In an effort to reduce the cost, the French Academy offered a substantial financial prize to anyone who could make sodium carbonate cheaply from salt.

Nicholas LeBlanc, an apothecary, solved the problem. By his process, sodium chloride is first reacted with sulphuric acid to form sodium sulphate. Heated with coke, this changes to sodium sulphide. Finally, a reaction between sodium sulphide and calcium carbonate gives sodium carbonate.

The LeBlanc method went unchallenged until 1863, when the Belgian chemist Ernest Solvay introduced his famous ammonia-soda process, now used to produce 90 percent of all sodium carbonate that is made. The Solvay process is an outstanding example of a complex reaction in which all the by-products are either re-used or sold.

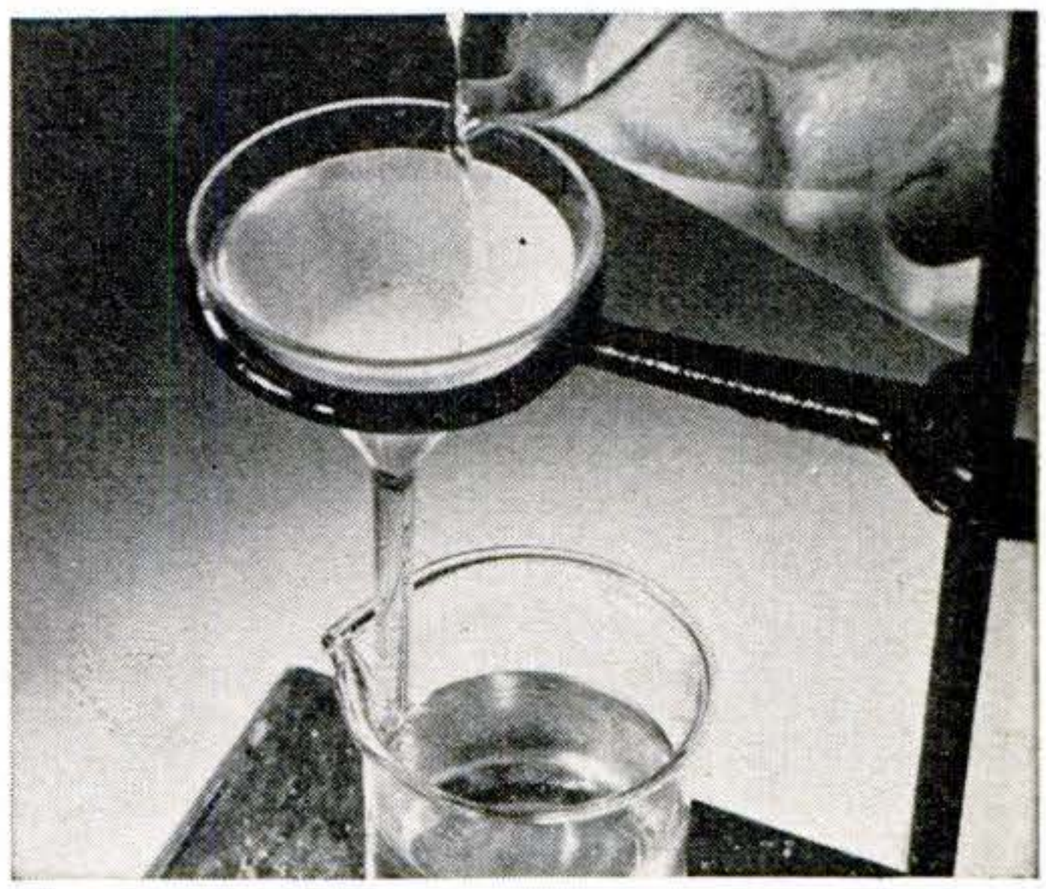
In practice, a saturated solution of salt is treated with ammonia and carbon dioxide. Ammonium bicarbonate forms, but this immediately reacts with the salt, producing sodium bicarbonate. As the latter chemical is only slightly soluble in the brine, it precipitates out. Removed by filtering, the bicarbonate is dried and then heated to change it into the carbonate. Ammonia and part of the carbon dioxide are recovered for use again. The by-product, calcium chloride, is used as a drying agent, to settle highway dust, and as a refrigerating fluid.

You can demonstrate this process with table salt, concentrated ammonium hydroxide, marble chips, hydrochloric acid, and calcium hydroxide (slaked lime).

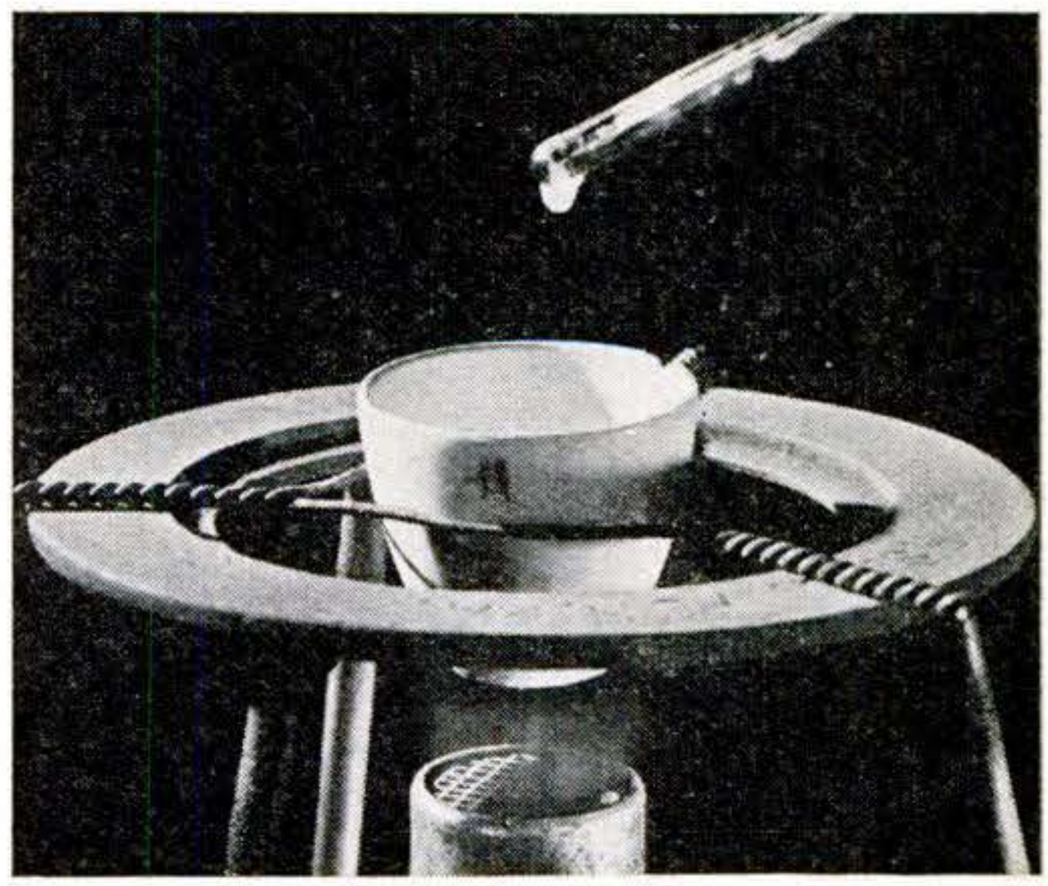
Dissolve all the salt you can in 10 ml. of 28-percent ammonium hydroxide solution, filter out any excess salt, and pour the clear solution into a test tube. Provide the tube with a one-hole stopper that has a glass outlet tube in it. Then set up a carbon dioxide generator. This consists of a flask with a two-hole stopper. In one hole, insert a thistle tube that reaches almost to the bottom of the flask. In the other, place a short delivery tube. Sprinkle some marble chips over the bottom of the flask and cover with about ½″ of water. This done, start the generator by pouring a little concentrated hydrochloric acid into the thistle tube. After allowing the gas to bubble for several minutes to drive the air out of the flask, connect the generator and the test tube with a length of rubber tubing.

At first, stopper the test tube lightly so

Bits of dry ice shaken in a strong solution of ammonium hydroxide saturated with table salt will also yield sodium bicarbonate. This may then be changed into the carbonate as below.



Sodium bicarbonate precipitated in the flask at the top of the page or the tube opposite is filtered out. It then should be washed with small quantities of ice water, as seen above.



After drying, heat the sodium bicarbonate in a porcelain crucible. This turns it into the carbonate. A drop of limewater held over the crucible proves carbon dioxide is given off.

Copyrighted material

Two common forms of sodium carbonate are seen here. At the left is soda ash, a grayish-white powder. Washing soda, right, is a crystalline form, each molecule having 10 of water.

that air is driven out. Then stopper tightly and shake vigorously. The fact that the carbon dioxide is under slight pressure helps it react with the solution. When the rising liquid reaches the thistle, loosen the test-tube stopper slightly to reduce the pressure. Since the reaction produces heat, cool the test tube between shakings by immersing it in cold water.

Within a few minutes, a heavy white precipitate of sodium bicarbonate will form in the tube. Separate this from the solution by filtering. Then, to remove traces of ammonium chloride, wash it in the filter by pouring a succession of very small portions of ice water through it.

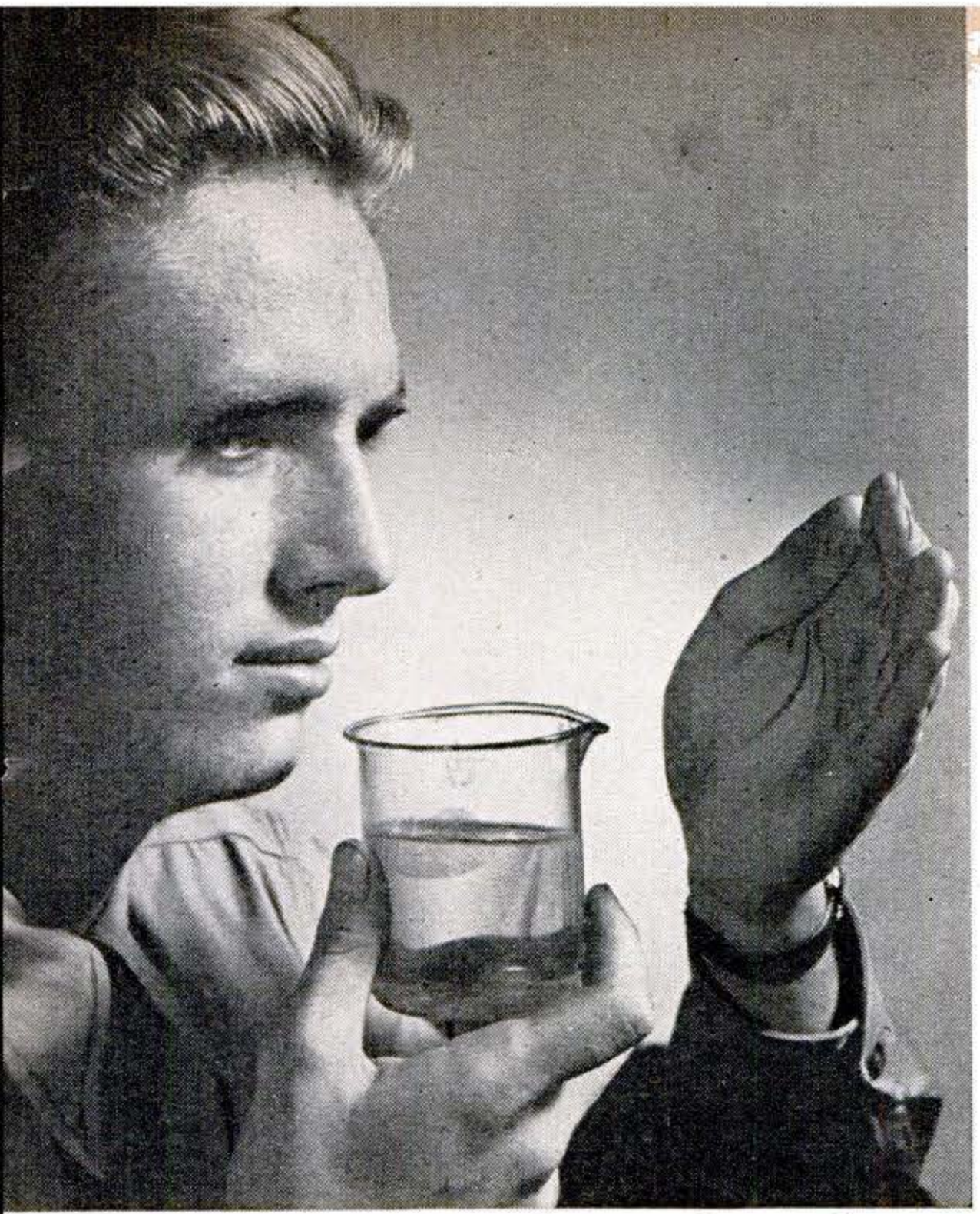
If solid carbon dioxide, or "dry ice," is available, the sodium bicarbonate can be made even more simply. Drop a few small pieces into a flask that contains the solution of ammonium hydroxide saturated with salt. Then shake the flask, holding it in the palm of one hand and closing the mouth with the other. Lift the upper hand occasionally to prevent too high a pressure. When the sodium bicarbonate precipitates, filter and wash it as described before. You then are ready to change the bicarbonate into the carbonate.

Although great quantities of sodium bicarbonate (ordinary baking soda) are used in making baking powders, in medicines, and as a source of carbon dioxide in fire extinguishers, this product is usually not sufficiently pure when it comes from the ammonia-soda process. Nearly all of it, therefore, is transformed into sodium carbonate by heating, or *calcining*—even though eventually some of it must be changed back.

Commercially, the calcining is done in huge rotary furnaces, with the fires outside, but you can do it on a small scale in a porcelain crucible. First, dry the sodium bicarbonate between pieces of filter paper and finally in the air. Then, fill a crucible about one-fourth full and heat it rather strongly. While heating, hold over the crucible a glass rod with a drop of limewater on its tip. The limewater will quickly turn milky, a test that carbon dioxide is being given off. After being heated for several minutes, the bicarbonate will have turned into the carbonate.

One difference between sodium bicarbonate and sodium carbonate may be shown by adding a few drops of phenolphthalein solution to a solution of each. By hydrolyzing, or combining partly with water, to form sodium hydroxide, sodium carbonate reacts as a moderately strong alkali, turning

Copyrighted material



Ammonia is freed from a solution of ammonium chloride when a little slaked lime is added.

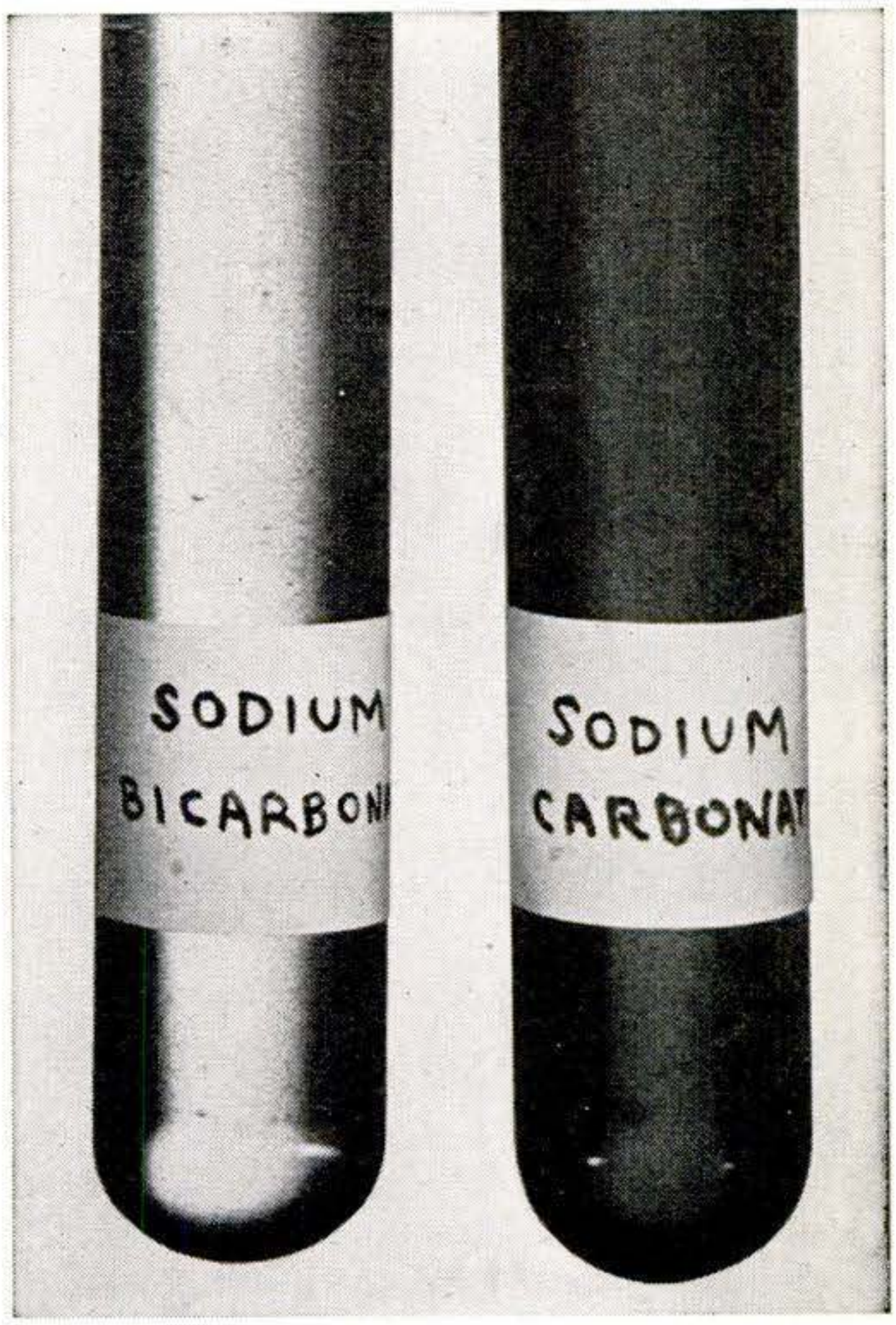
Adding a solution of calcium hydroxide to one of sodium carbonate gives sodium hydroxide.

the solution a deep pink. Except when heated, sodium bicarbonate scarcely hydrolyzes. It produces only a faint coloration.

As already mentioned, the ammonia required in the Solvay process may be used over and over again. Otherwise, the process would be a failure, for the ammonia needed to produce 1 lb. of sodium carbonate costs more than the carbonate itself. How this gas can be removed from the ammonium chloride solution remaining after the sodium bicarbonate has been filtered off may be demonstrated by adding a little slaked lime. The reaction forms calcium chloride and ammonium hydroxide, and the ammonia, freed by heating, may be smelled by wafting the vapors toward your nose.

Soda ash, the crude sodium carbonate of commerce, is a grayish-white powder. Washing soda is made by dissolving this in water and then allowing the water to evaporate until crystals are formed.

Caustic soda, or sodium hydroxide, is sometimes made from sodium carbonate by treating a solution of the carbonate with a solution of calcium hydroxide. You can do this yourself to see how it works. A white cloud of calcium carbonate will be precipitated. The sodium hydroxide remains in solution. END



One difference between sodium bicarbonate and carbonate is seen if phenolphthalein solution is added to a solution of each. Carbonate, a moderately strong alkali, turns a deep pink.

Copyrighted material

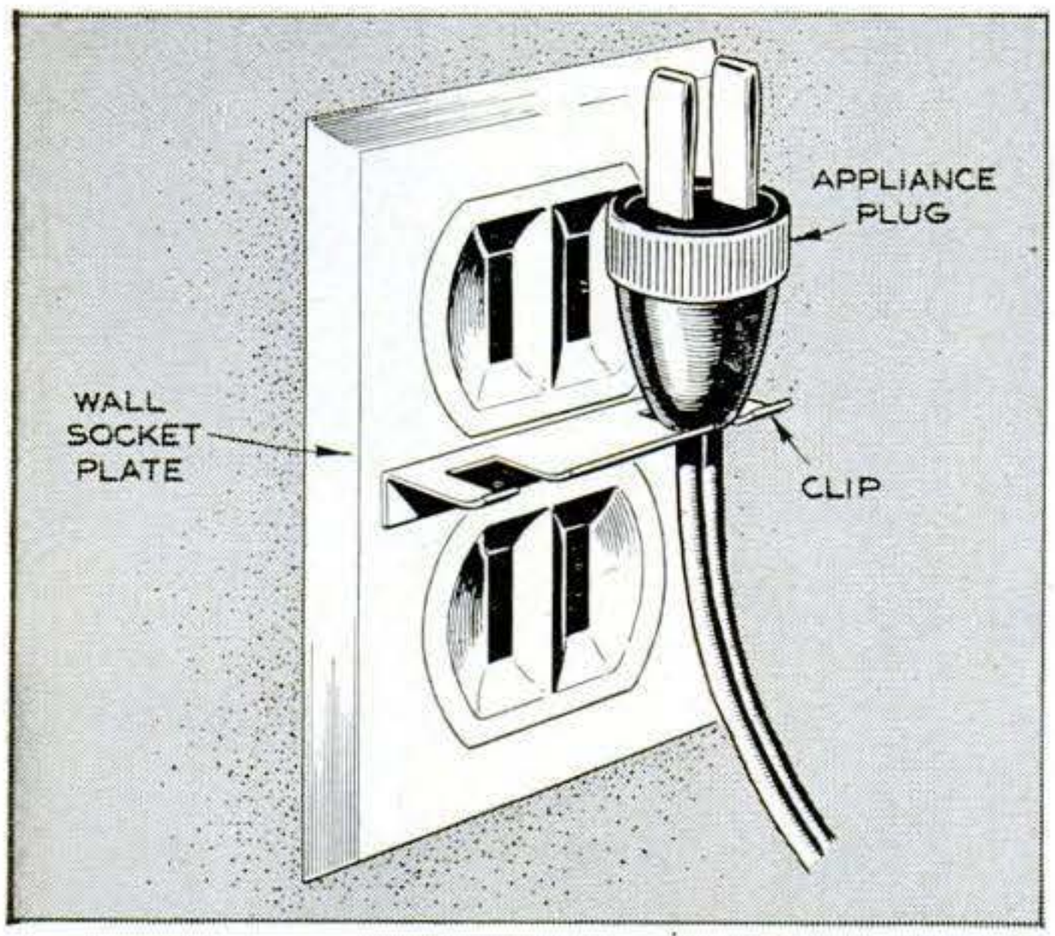
Kitchen Cupboard Has Disappearing Vegetable Bin

BESIDES holding its quota of cans, jars, and bottles, this handy kitchen cabinet has a tilting vegetable bin that can be opened or shut with one hand, stays in either position, and lifts out for cleaning.

The cupboard shown was built from part of an old bookcase. You can start from scratch, though, by nailing together 10″ boards into bookcase form with butt joints. Since a kitchen piece is usually enameled, old or knotty lumber will serve. Nail ¼″ plywood or wallboard on the back. Grooves for the sliding doors can be plowed with a rabbet plane, built up on the edges of the horizontal boards by nailing on first a narrow and then a wider strip, or formed by bradding quarter-round molding to the underside of the top board and the top of the lower board. Make the door panels of such a size that they can be raised in the top groove and lifted out for cleaning.

For sturdiness, the bin should be assembled with glue and wood screws. It pivots on two dowels set in the ends of the cabinet 3″ from the front edge. The dowels seat in notches cut in the endpieces of the bin, as seen in the photo at the left above. The extra holes are for ventilation; similar ones should be bored in the cabinet ends.

When in, the bin rests on two blocks behind the pivot pins. When pulled open, it is stopped by the sloping cross member set in solidly below the shelf.—R. HOPPOUGH.



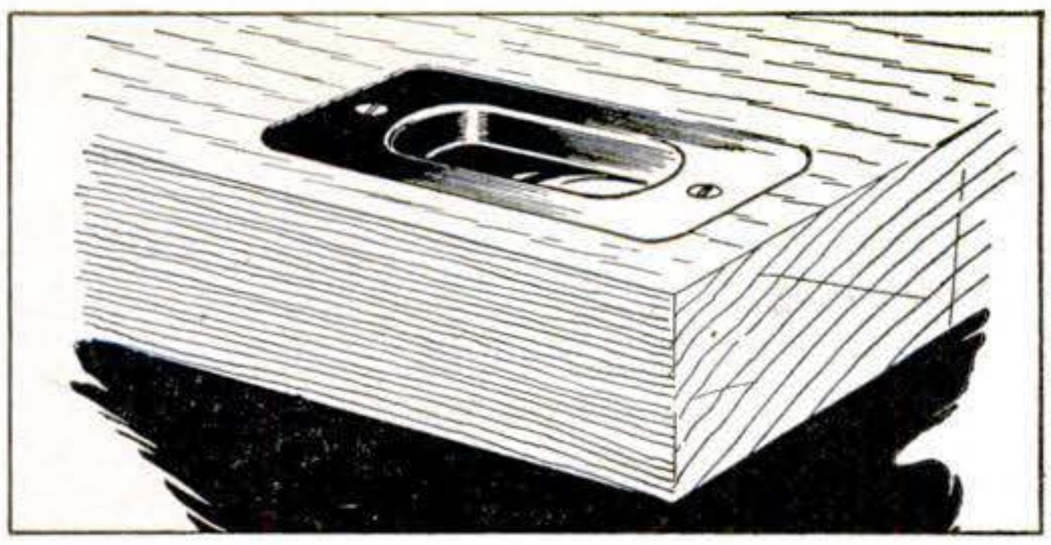
Clip Holds Appliance Plug

IF A plug must be detached from a wall socket when an electrical appliance is not in use, this clip will make it unnecessary to stoop down each time you want to use the appliance. Notch a piece of metal to receive the cord, bend to a 90-degree angle, drill a hole, and mount on the socket plate by the plate screw.—W. B. EAGAN.

Jar Stores Composition Wood

PLASTIC composition wood bought in cans usually dries out no matter how tightly the top is pressed on. As a solution, I now store the can inside a large-mouth glass jar with a screw top, turning down the top against a gasket made from oiled paper. Stored in this way, plastic composition wood remains moist for many months.—A. S. JAMIESON.

Copyrighted material



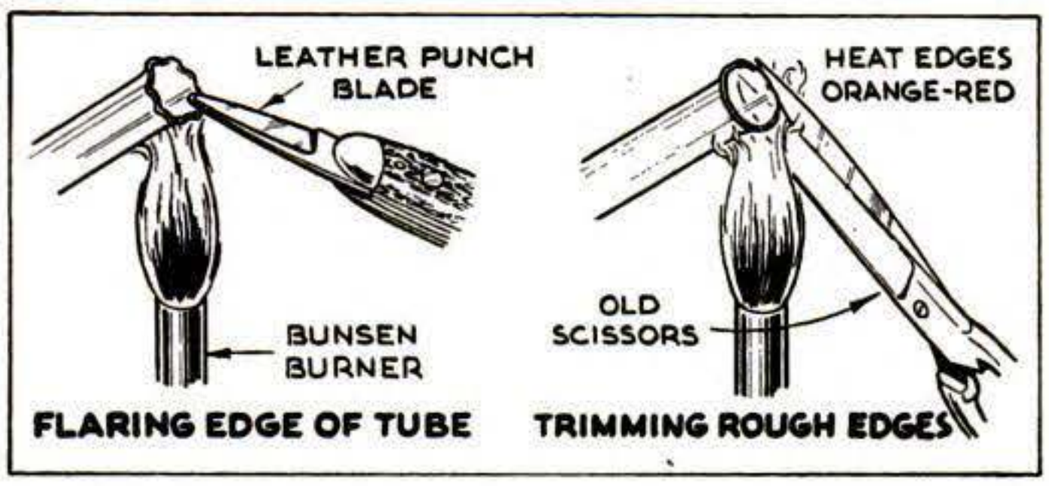
Workbench Trough Is Handy

SET in a recess cut into the corner of the workbench, a metal trough will be found convenient as an ash tray or to hold small parts. One of the troughs used on sliding doors is good for this.—FRANK SHORE.

Test Tubes May Be Repaired

TEST tubes that have broken near the top may be returned to use by the method illustrated below. First, heat the jagged edges and flare them out by pressing with the leather-punch blade of an old jackknife or a similar instrument.

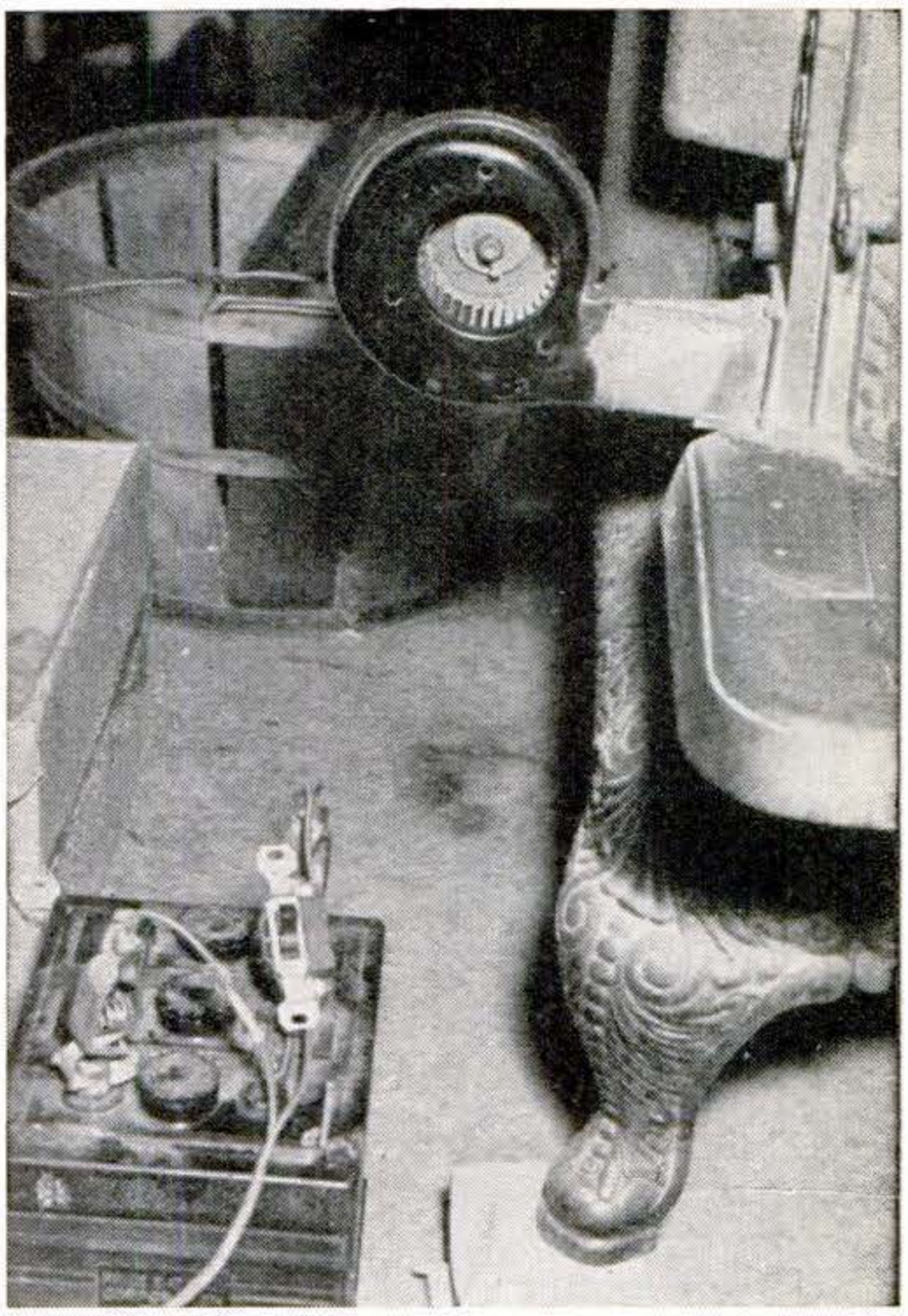
After this, heat each sharp point to an orange color and trim off with an old pair of scissors. Finally, turn a bead with the punch blade, and fire-polish. It is not necessary that either the knife or scissors be as hot as the glass, although a cleaner job can be done if the tools are heated to some extent.—JOHN L. STORY.



Spring Keeps T-Square Square

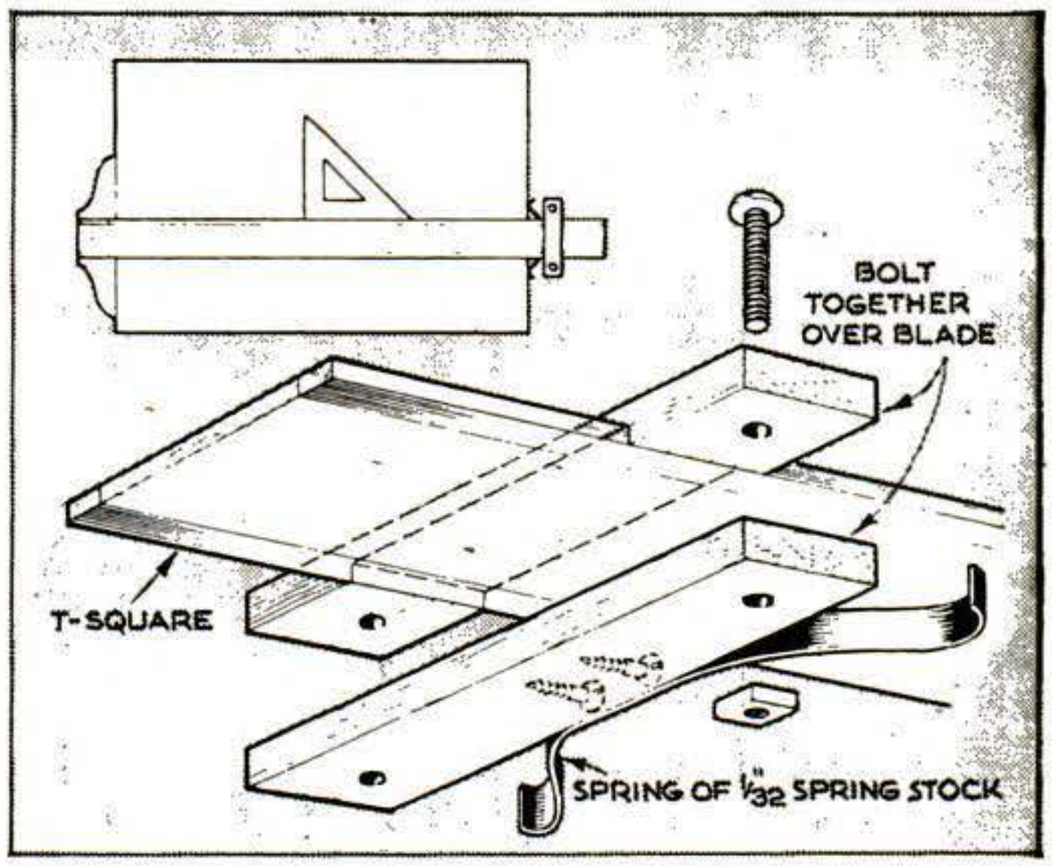
ANY T-square can be converted into a parallel ruler with the attachment illustrated at the right. It also allows a draftsman to have both hands free, for the T-square is held firmly against the board.

It may be made from light wood, metal, or plastic, the dimensions being suited to the thickness and width of the particular T-square. In one piece, cut a groove as wide as the blade of the square, but not quite as deep. To the other piece, attach a short length of 1/32″ spring stock. Bolt the two pieces over the blade.—JOSEPH F. GRECE.

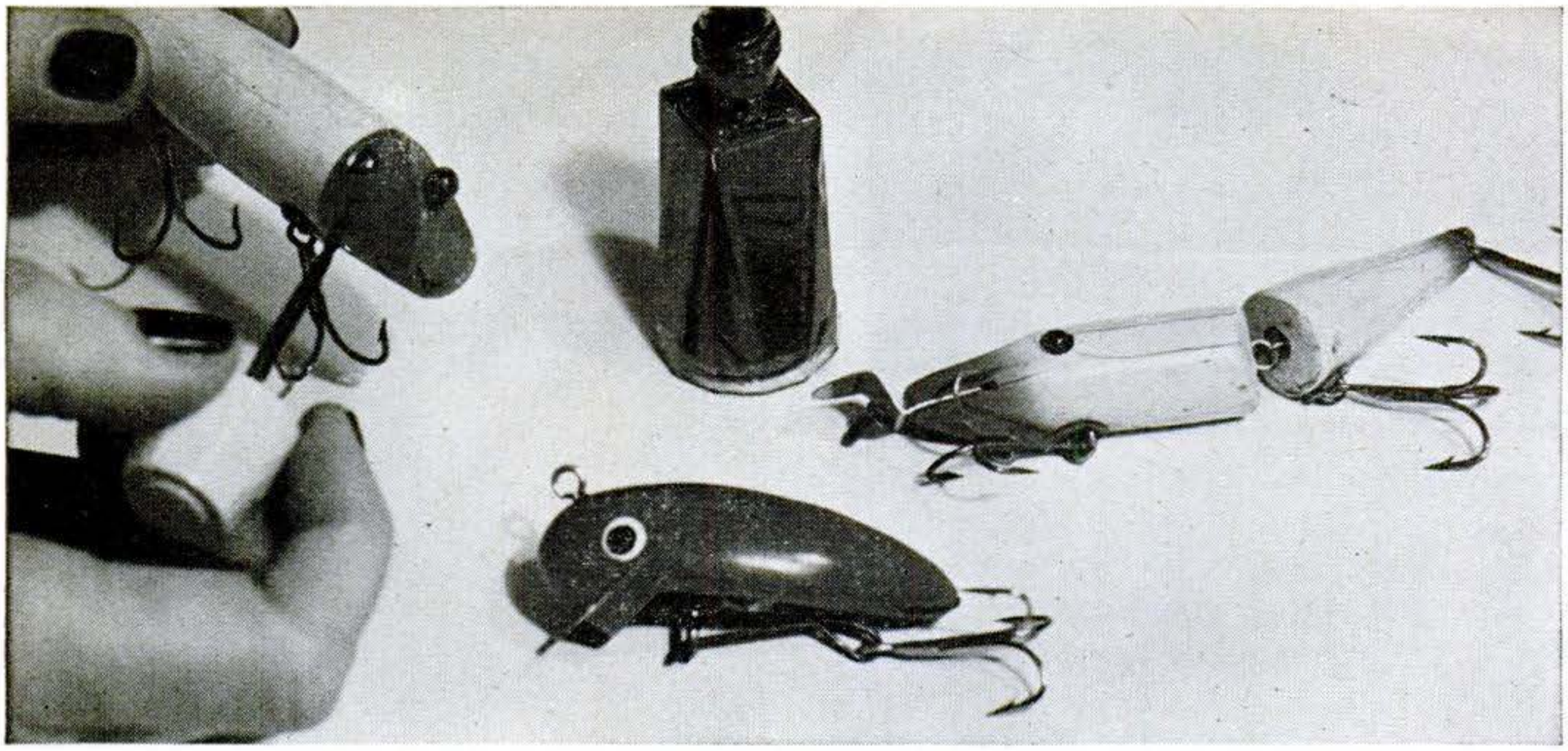


Fan Heats Coal Range Quickly

THE coal range in the kitchen of our country house did not draw well, probably because the chimney is a bit too low. Some sort of forced-draft system was obviously the answer, but since the house is not electrified and I couldn't locate a satisfactory 6-volt blower, I was stumped for a time. Finally I hit upon the idea of taking the fan and motor from an old car heater. Connected by a tin can to a hole cut in the ash pit and powered by our radio storage battery, this rig now quickly makes the stove top red hot or brings the oven to baking temperature.—E. V. COLLINS.



Copyrighted material

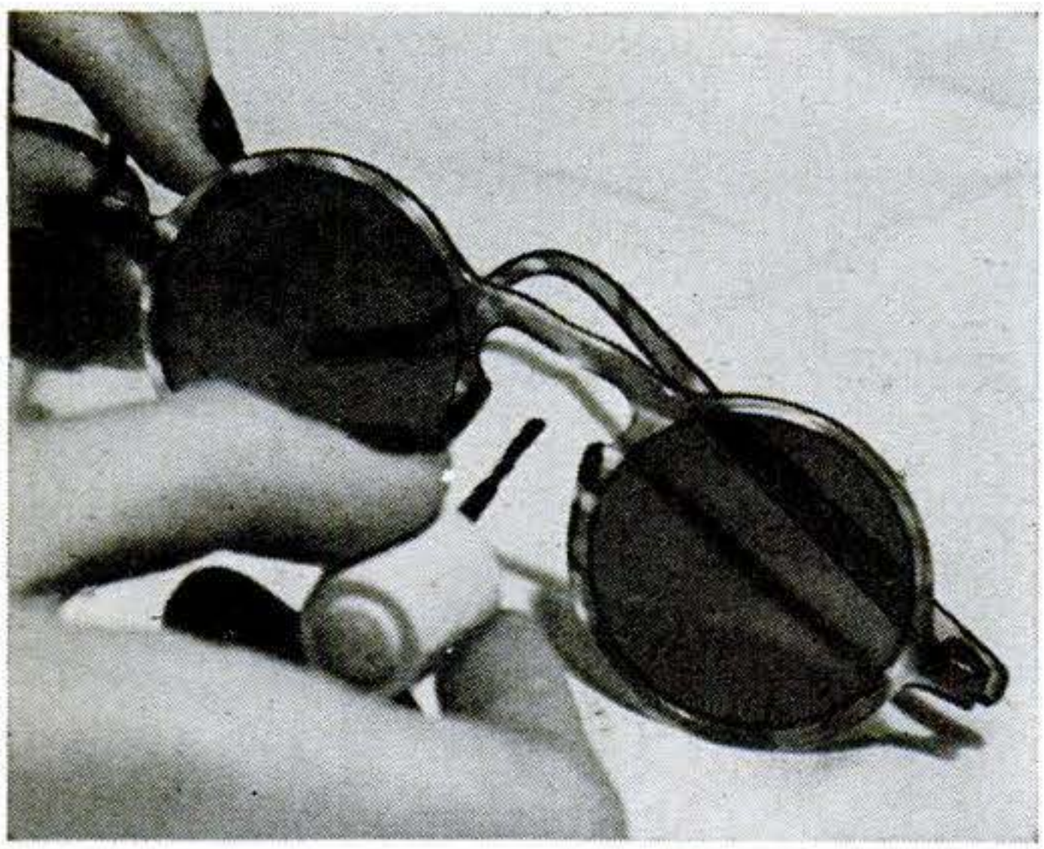


Those old plugs may catch more fish if their red heads are brightened up a bit. Try a dab of polish on some of the duds that never did catch on. It could be all they really needed.

Handy Nail-Polish Hints

ON THE beautiful hands of a woman or in the skilled hands of a man, nail polish can be one of the most useful as well as decorative of household items. In addition to the colorless variety and the myriad shades of red, it comes in blue, green, and other colors. Try it as a touch-up enamel on cannisters, cord pulls, kitchen clocks, and knickknacks. If you have the skill and a fine brush, you can work up some pleasant designs for your glassware and ashtrays.

Nail enamel dries quickly and you don't have to be afraid of making mistakes; if you do, just trot out the polish remover and try again. Soap, water, and alcohol normally do not affect it, but where it will be subject to hard wear, an extra sealing coat is recommended. If you want a few tips on how to use it, take a look at these pictorial suggestions by F. Brady and Kenneth Murray. You will find that nail polish adheres well to practically any dry surface.



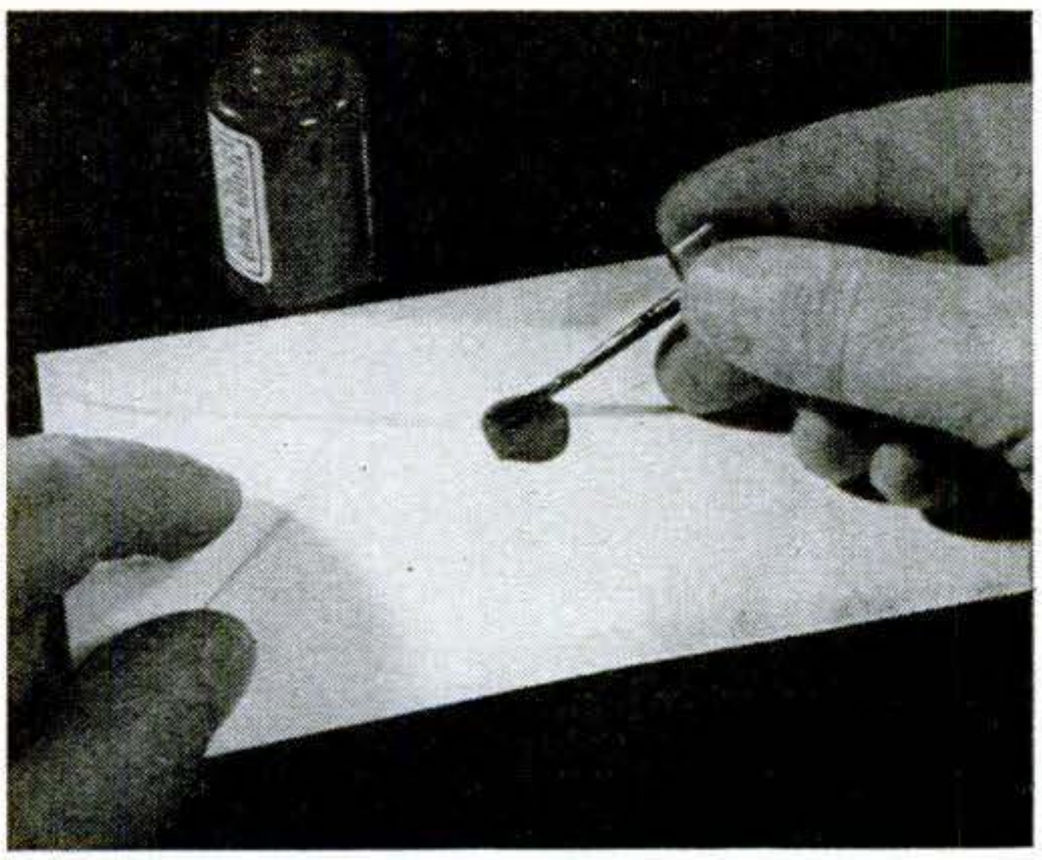
A new note in sportswear. You can give the frames of your old sun glasses a real lift with a coat of dark red or blue lacquer. Earpieces may be the same or a different color.

Feeding bowls for your pet can be decorated with good effect, and if you have more than one animal to take care of, there's nothing like labeling dishes to keep them separated.

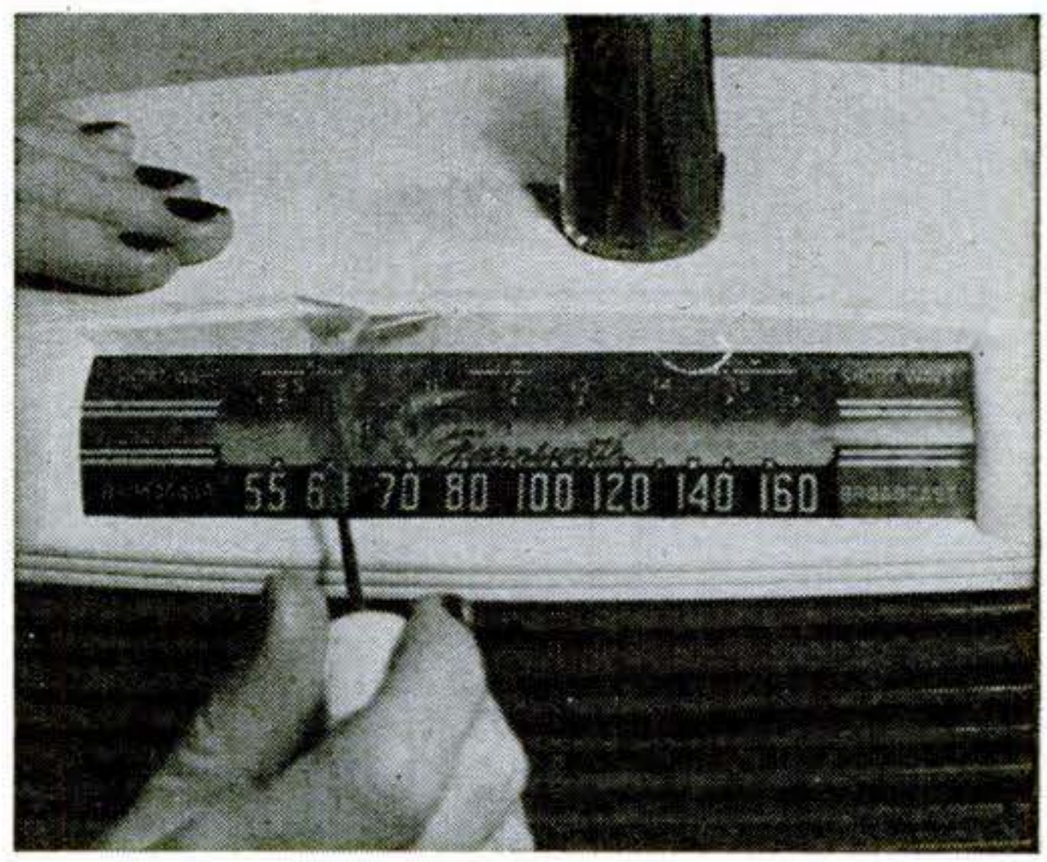
Copyrighted material

Guests will appreciate individually labeled party glasses that won't get switched around.

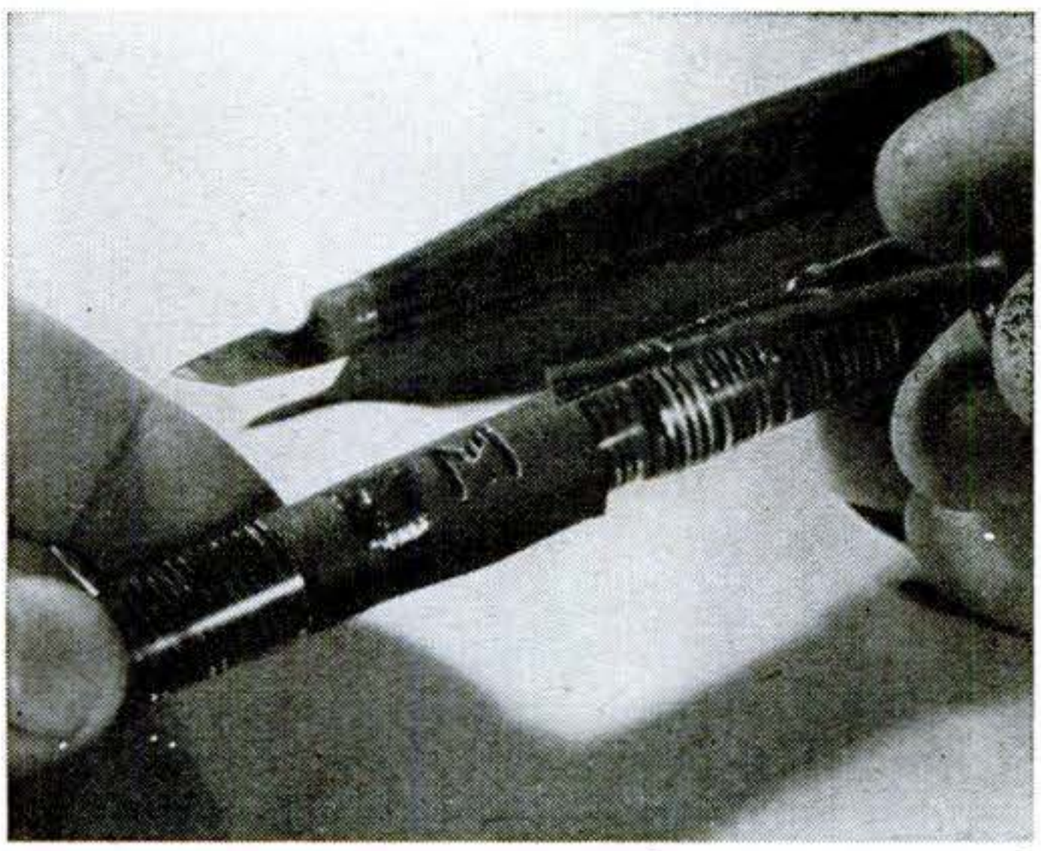
Marking cocktail ingredients on the outside of the shaker makes a perfect round every time.



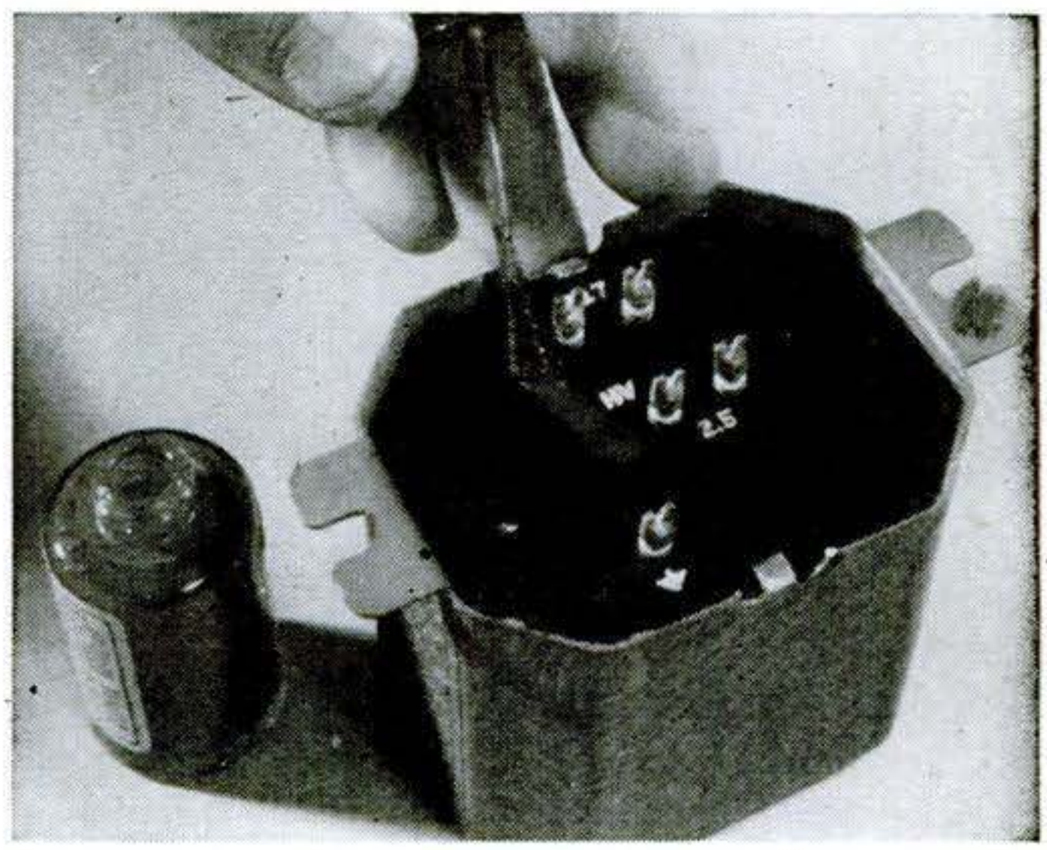
For sealing important letters, try a dab of thick nail polish in place of sealing wax. It doesn't have to be warmed in a flame, is flexible when dry, and adheres as well as wax.



Locate favorite stations on a radio dial with arrows painted between convergent cellulose-tape masks. Don't use remover if the original lettering is on the front of the dial window.



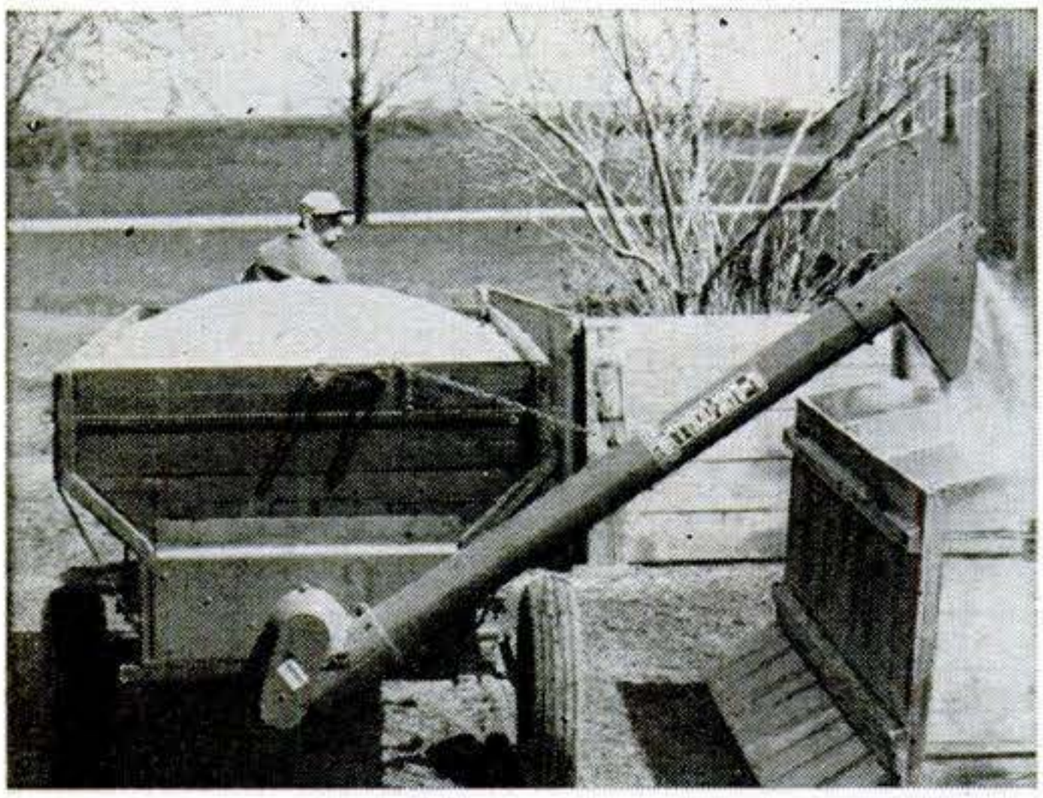
Initials may be applied to fountain pens and similar personal possessions with polish and masking tape. Cut the letters carefully with a razor blade, and apply two coats of lacquer.



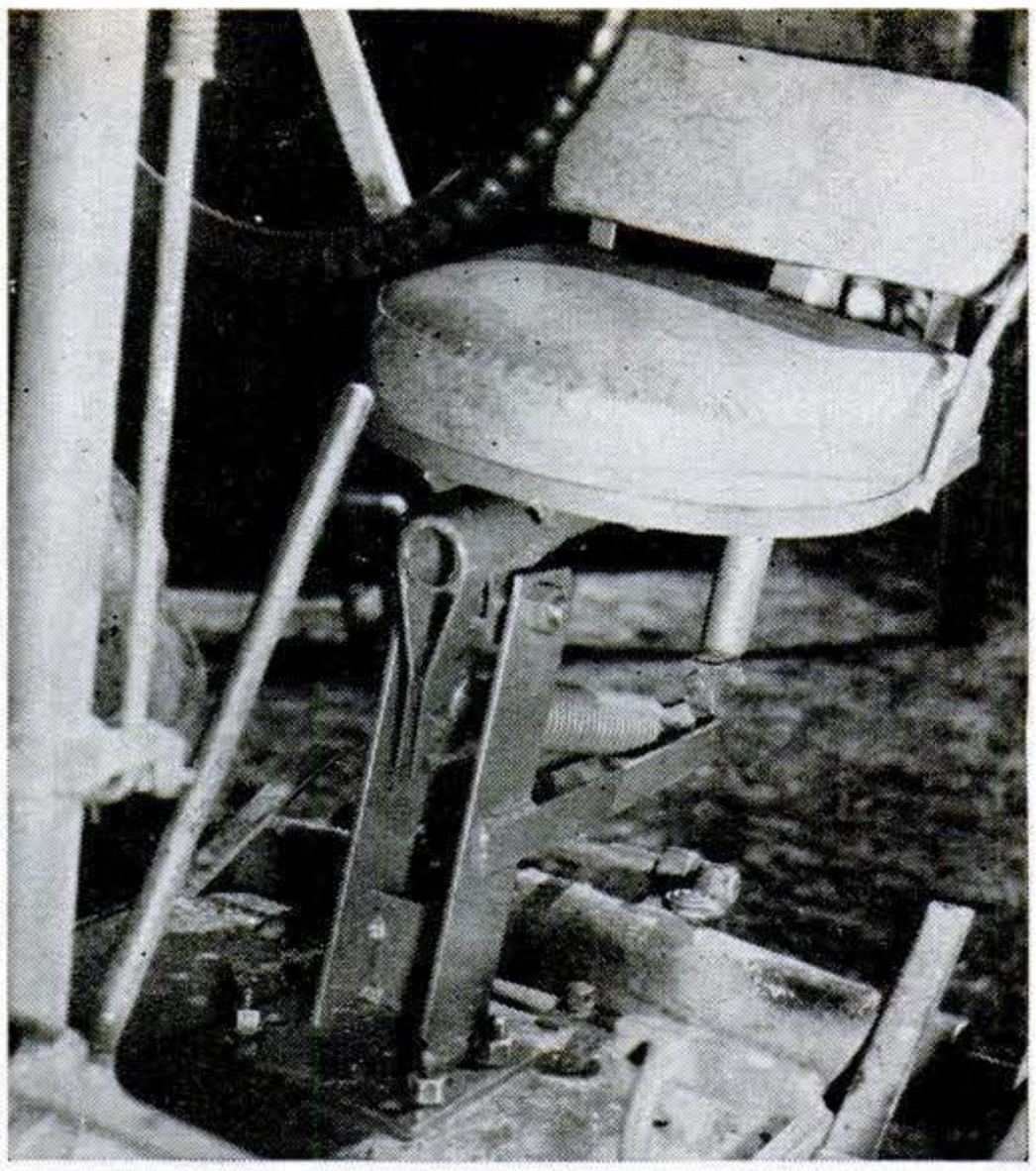
To warn you and others against touching high-voltage leads, mark danger points in red during installation. You can also use nail polish to identify terminals in a radio chassis.

Copyrighted material

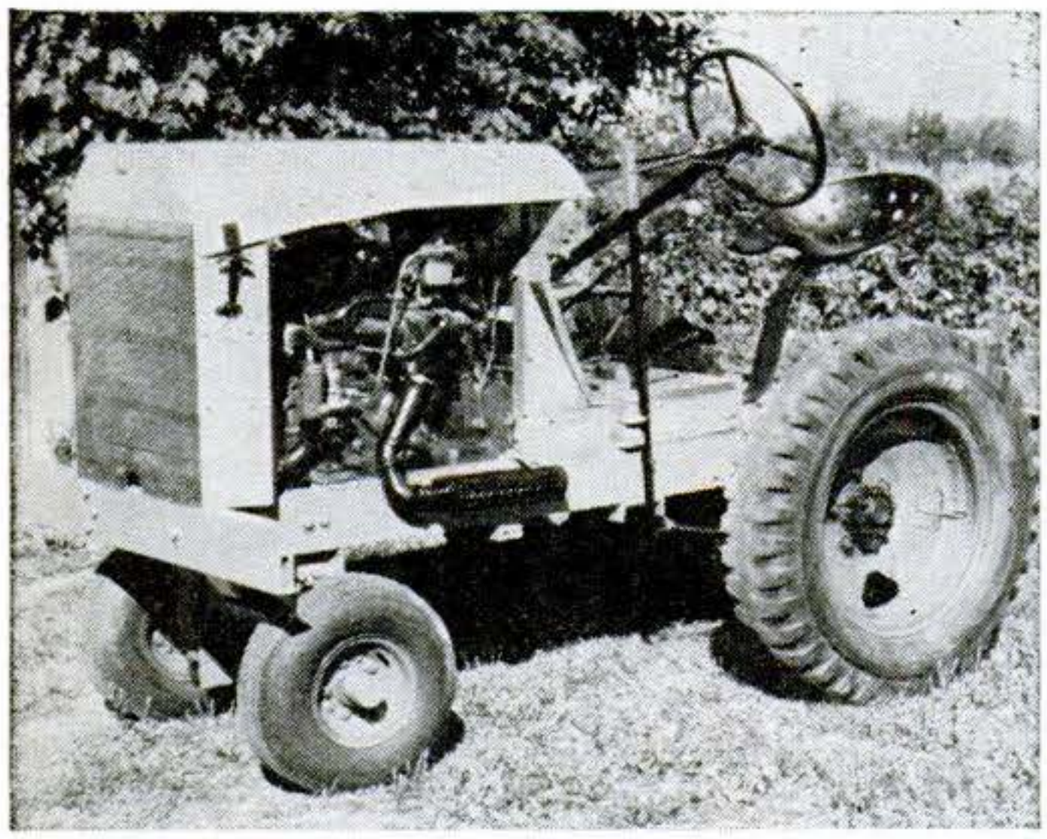
FOR EASIER FARMING



Grain Unloaded by Power. Designed to fit all 38″ wagon beds, an unloader made by Piper-Odell, of Princeton, Ill., includes a V-type false bottom with an auger running its entire length. A direct drive from the tractor power take-off turns this augur, which in turn drives another auger in the elevator tube. The unit is removable so the wagon may be used for other farm work.



Seat Remains Level. Sideways swivel action keeps this tractor seat level and the operator on an even keel on a steep hillside. In addition, a hydraulic cylinder and adjustable spring provide cushioning action in the up-and-down plane. Called the Joy Rider, the seat is a product of the Fleischer-Schmid Corporation, of Columbus, Neb. It sells for about $10.



Tractor Built at Home. Powered by a 60-hp. Jeep engine, this 1,600-lb. tractor was designed and built by Russell Pickering and his son, of Bryan, Ohio. Built on a bolted frame of 4″ and 5″ channel iron, it has a standard Willys transmission with a 4-to-1 ratio, and a chain and sprocket between the transmission and drive shaft. A 1940 Ford truck rear end is also used, with hydraulic foot brakes and an individual mechanical brake for each rear wheel.

Popcorn Pops Better. Experimenters at Michigan State College have found that popcorn kernels must contain just a certain amount of moisture to pop satisfactorily. The correct amount can be obtained by a simple trick. For 1 lb. of popcorn, dissolve all the salt you can in 1 oz. of water. Soak up this with strips of paper toweling, scatter the strips through the popcorn, and seal in a jar for 10 days. The salt gives off or absorbs moisture as needed.

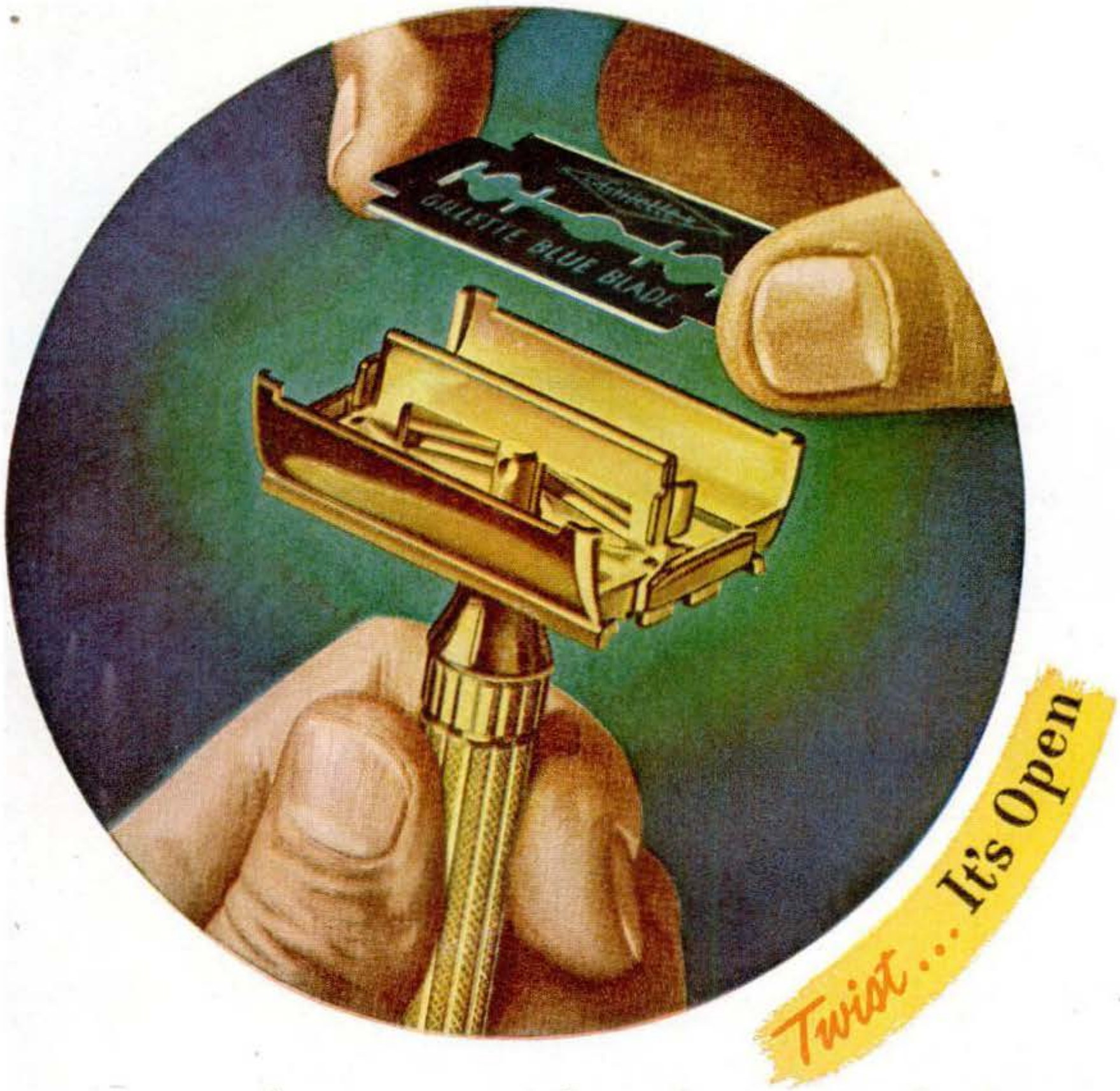
Copyrighted material

Here's why your dime buys more with Ray-O-Vac LEAK PROOF

1. It has as much or more POWER than ANY flashlight battery!
2. It retains that POWER longer It stays fresh for years and years!
3. It gives light when you need it!
4. It guarantees your flashlight against corrosion or swelling!
5. It's steel clad!
6. It's LEAKPROOF!

© RAY-O-VAC COMPANY, MADISON 3, WISCONSIN

Buy Spares..... They Stay Fresh



You enjoy extra shaving speed and ease with the modern..

Gillette One-Piece Razor!

Gillette Aristocrat One-Piece Razor, gold-plated, with case and ten Gillette Blue Blades . . **$3.79**

Gillette Milord One-Piece Razor, gold-plated, with case and five Gillette Blue Blades . . **$2.50**

TO save time and shave with utmost comfort and convenience, get a Gillette One-Piece Razor. There's nothing to take apart or put together. You change blades in a jiffy. Twist . . . the razor opens. Twist again . . . your blade is locked in shaving position. To clean both razor and blade just loosen the holder, rinse and shake. See the Gillette Aristocrat and Gillette Milord One-Piece Razors. They're the finest shaving instruments money can buy. Either will give you years of satisfaction.

Gillette Safety Razor Company • Boston 6, Mass.

look *SHARP!* **feel** *SHARP!* **be** *SHARP!*

use Gillette Blue Blades

with the *SHARPEST* edges ever honed

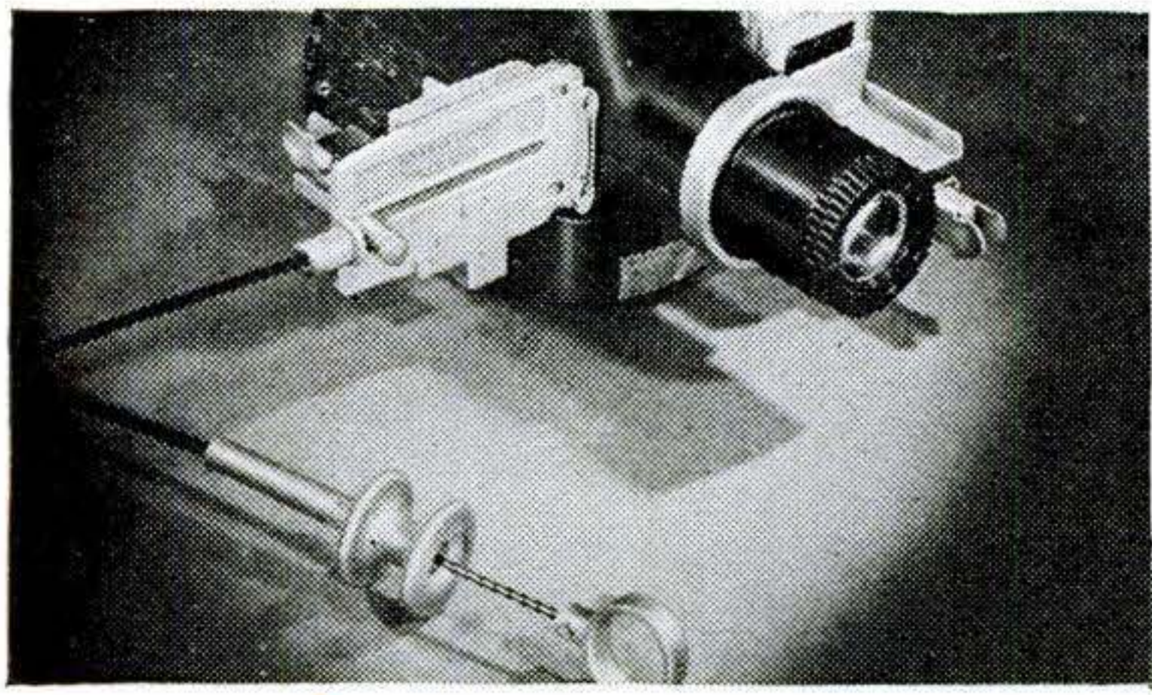
Copyright, 1947, by Gillette Safety Razor Co.

Copyrighted material

It projects bright images up to 40 inches wide

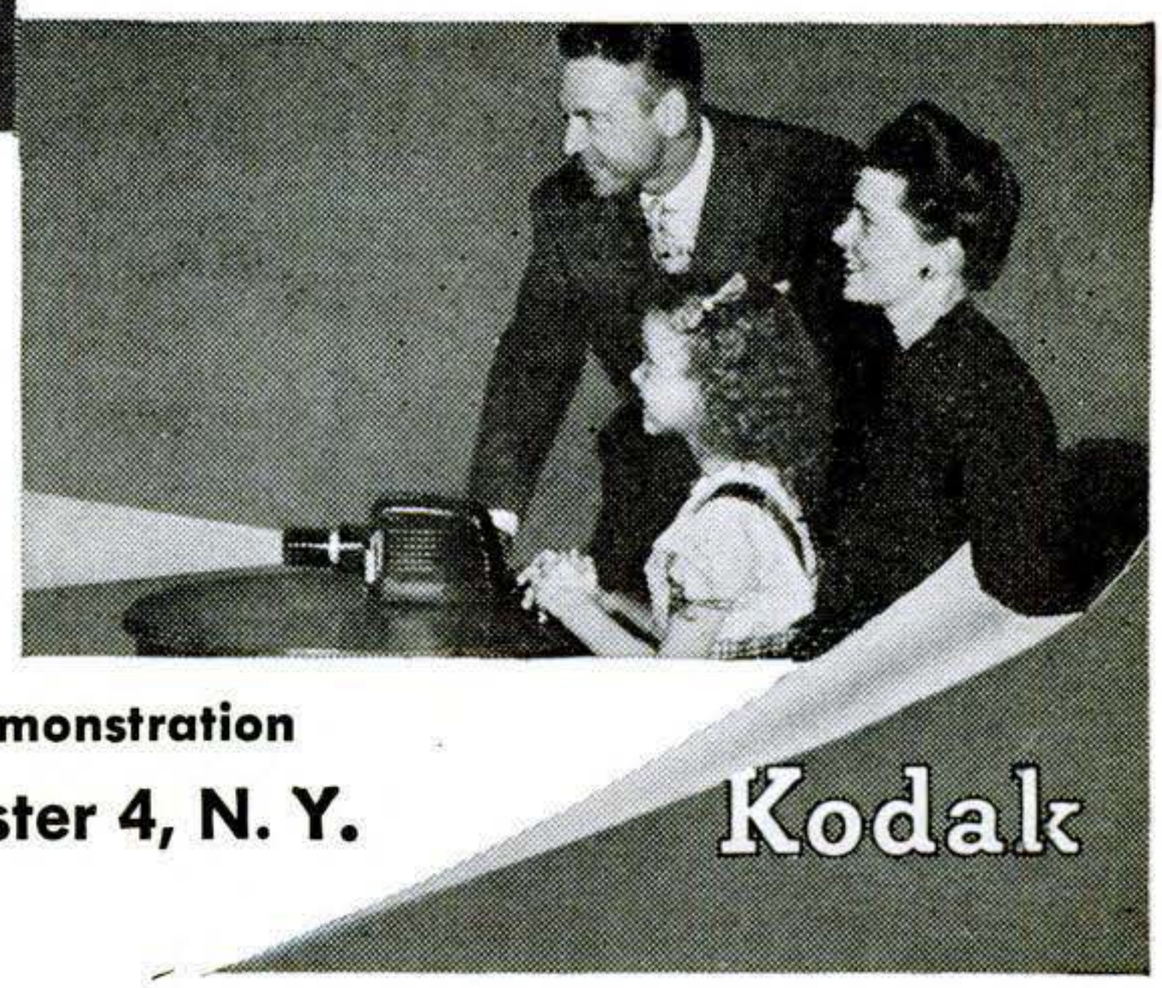
and it costs only $27.50

THE NEW KODASLIDE PROJECTOR, MODEL 1A



It's simple to operate, easy to store. *Lumenized Optical System*—boosts screen brilliance 50%; *Kodak Projection Ektanon Lens* 4-inch *f*/3.5—easily focused, needle-sharp; *Heat-absorbing Glass*—protects transparencies from overheating; *150-Watt Lamp*—throws plenty of light across average-size room.

For that "professional touch" use the KODASLIDE CHANGER, illustrated above. One slide follows smoothly right after another. The changer does the work...you just push the plunger for the next slide. The screen is darkened while slides are being changed. One loading shows up to 46 cardboard slides.



Visit your nearest Kodak dealer for a demonstration

Eastman Kodak Company, Rochester 4, N. Y.

Kodak

Copyrighted material

"Half the fun and twice the success" come from having

the RIGHT TOOLS for the JOB

NICHOLSON strives to make fun and success a certainty so far as working with files is concerned. For there are more than 3000 kinds, cuts and sizes in the Nicholson and Black Diamond lines—their uses ranging from battleship building to watchmaking.

Of course, you don't have to have them all. A kit of Nicholson X.F. Swiss Pattern Files; a few well-chosen Special Purpose Files (some being of exclusive, patented Nicholson design); and a modest assortment of Regular Purpose types . . . such a variety constitutes a well-balanced complement of files for the average home workshop. Good hardware houses can advise you and supply you with the right files for your needs. Send for "File Filosophy," famous Nicholson 48-page book on kinds, use and care of files.

NICHOLSON U.S.A.

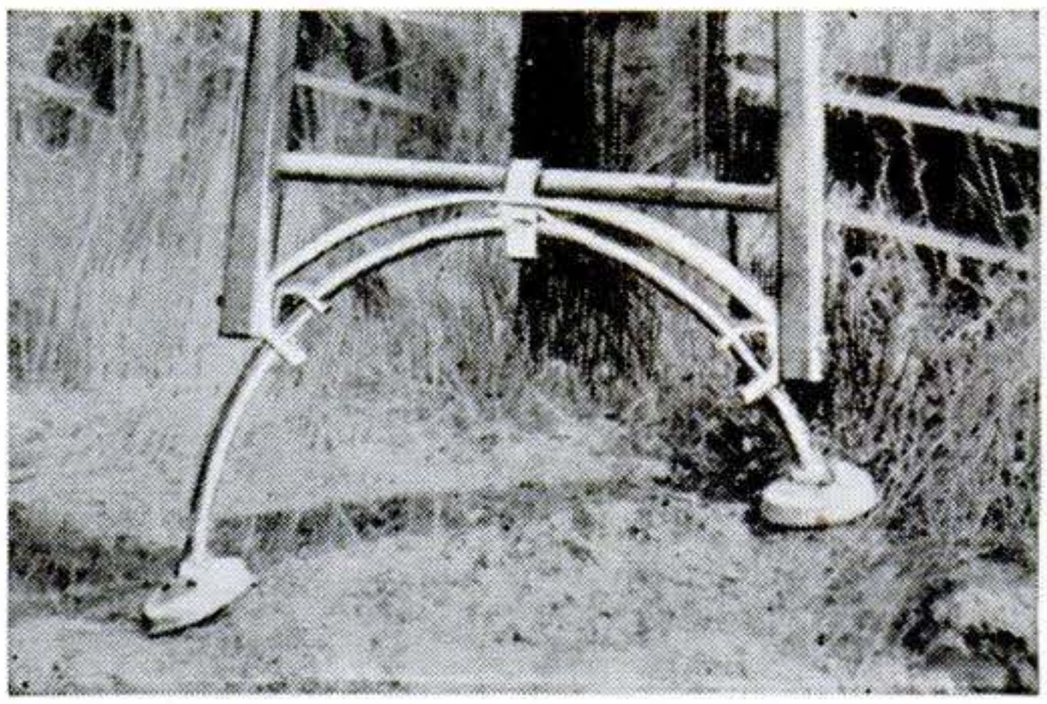
NICHOLSON FILE CO.
19 Acorn St., Providence 1, R. I.
(In Canada, Port Hope, Ont.)

BLACK DIAMOND TRADE MARK

NICHOLSON FILES *FOR EVERY PURPOSE*

Cage Ends Tire Hazard

IF THE retaining ring blows off that tire being inflated above, the man is protected by a safety cage of two-inch steel tubing designed by the Firestone Tire and Rubber Co., of Akron, O. Weighing 425 lb., the cage handles tires up to 12 by 24 inches.



Base Levels Ladder

STEADYING a shaky ladder is easy with this attachable base, consisting of an aluminum truss joined to a steel-pipe half circle that automatically slides to level the ladder on an uneven surface. Carborundum shoes on ball-and-socket joints at the ends of the pipe assure a firm ground grip. Produced by Akron Steel and Sales, Inc., of Akron, O., the base is locked securely in place by the weight of the ladder.

Copyrighted material

Dependable

CHAMPION

AMERICA'S FAVORITE SPARK PLUG

Dependable Champion Spark Plugs will give you sparkling performance in cider season as in every season. But the first few crisp days of Fall should be a reminder to you that your spark plugs should be serviced. If you find that new ones are needed, be sure to ask for dependable Champions—America's Favorite Spark Plug for every engine.

Champion Spark Plug Company, Toledo 1, Ohio.

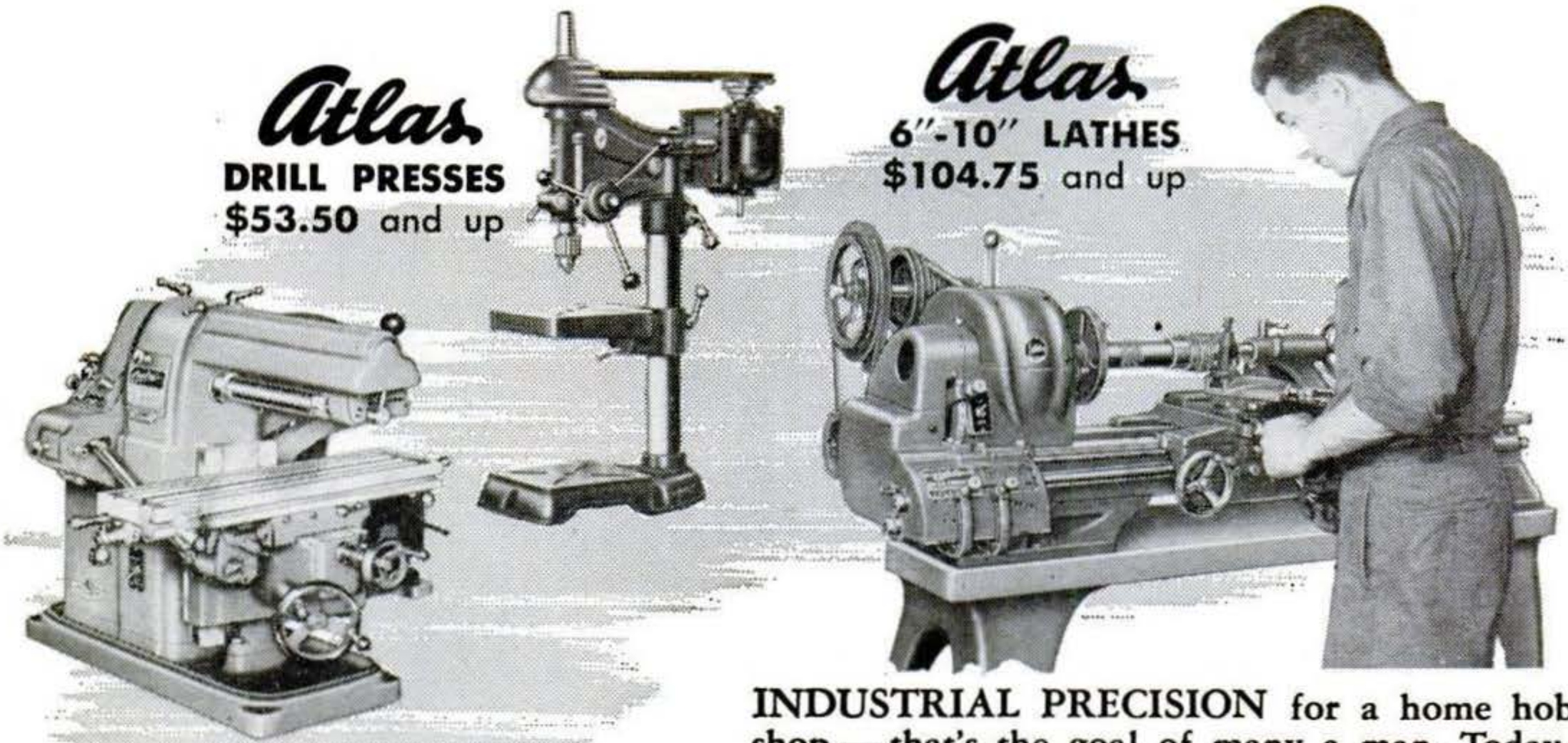
FOLLOW THE EXPERTS

DEMAND NEW DEPENDABLE CHAMPIONS FOR YOUR CAR

Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network

Copyrighted material

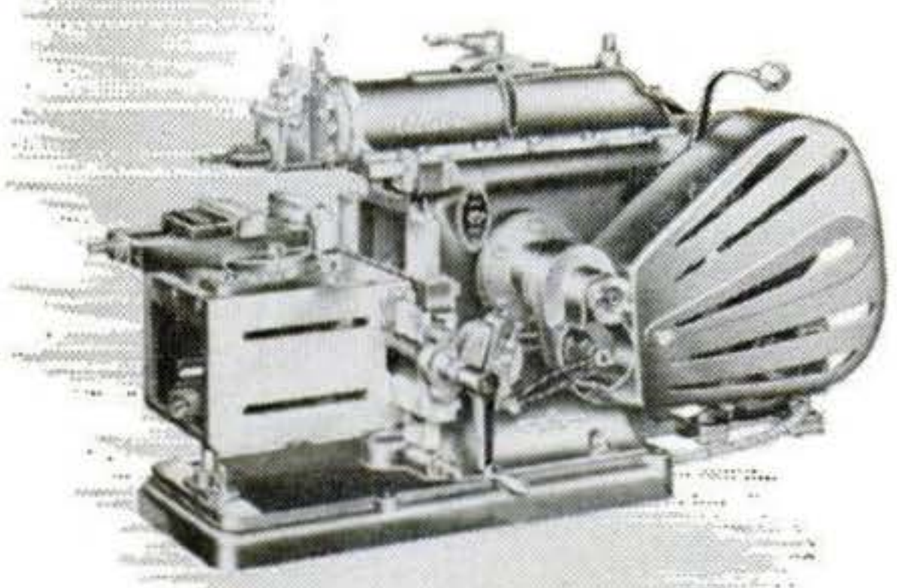
Get Set for the BEST SHOP
With These Fine Atlas



Atlas
DRILL PRESSES
$53.50 and up

Atlas
6"-10" LATHES
$104.75 and up

Atlas
MILLING MACHINES
$285.00 and up



Atlas SHAPER
$335.00

INDUSTRIAL PRECISION for a home hobby shop — that's the goal of many a man. Today, it can be realized. Atlas precision metal working tools, built to industrial quality standards, will add to your shop's usefulness, save on home equipment repairs, and save on many types of home furnishings.

Tools for YOU, Incorporated

If your shop interest is profit-wise — for business development — Atlas tools provide ideal research and production equipment. Whatever the products or projects you have in mind, these compact, precise tools will handle your work to perfection.

Built for Lifetime Service

Atlas tools are industrially engineered to give you a lifetime of usefulness. See your Atlas distributor today or write for his name. He'll gladly help you start your metal-working shop this Fall.

ATLAS PRESS CO.
1155 N. Pitcher Street
KALAMAZOO MICHIGAN

LATEST CATALOG FREE

ATLAS PRESS COMPANY
1155 N. Pitcher St., Kalamazoo, Mich.

Kindly send your latest catalog. I am particularly interested in a ☐ Lathe ☐ Drill Press ☐ Milling Machine ☐ Shaper ☐ 10" Table Saw.

NAME _____

ADDRESS _____

CITY, STATE _____

Atlas
10" SAWS
$97.50

ALL PRICES F.O.B. KALAMAZOO, LESS MOTOR

Copyrighted material

YEARS of YOUR LIFE! *and* POWER KING TOOLS

NOW every home shop owner can afford to equip with power tools. Furniture, cupboards, cabinets, toys, shelves . . . anything in wood that you want to make . . . can be handled in short order, at a fraction of the cost when bought outside.

A New Idea for Home Shops

PK tools are designed for men who enjoy their home shop as a hobby . . . but are practical about it, too. They give you the basic ruggedness, accuracy, and capacity you need for your various projects . . . yet are priced so you can equip with the full range of Power King tools within the cost formerly required for but two or three machines.

Sensational Values

You'll quickly recognize the quality construction of Power King tools — and be proud to have them in your shop. Ask your nearest Power King dealer (name sent on request) to show you the tools that are ready for you right now.

POWER KING
POWER KING TOOL CORP.
WARSAW, INDIANA

POWER KING TOOL CORP.
1135 CLEVELAND ST., WARSAW, IND.
***Division of* ATLAS PRESS CO.**

ALL PRICES F.O.B. WARSAW, LESS MOTOR

SEND FOR FREE LITERATURE

POWER KING TOOL CORPORATION
1135 CLEVELAND ST. WARSAW, INDIANA

Please send me your latest catalog sheets about
☐ 7"-8" Table Saws ☐ 15" Jig Saw ☐ Drill Press ☐ 12" Band Saw ☐ Spindle Shaper ☐ Jointer-Planer ☐ Wood Lathes.

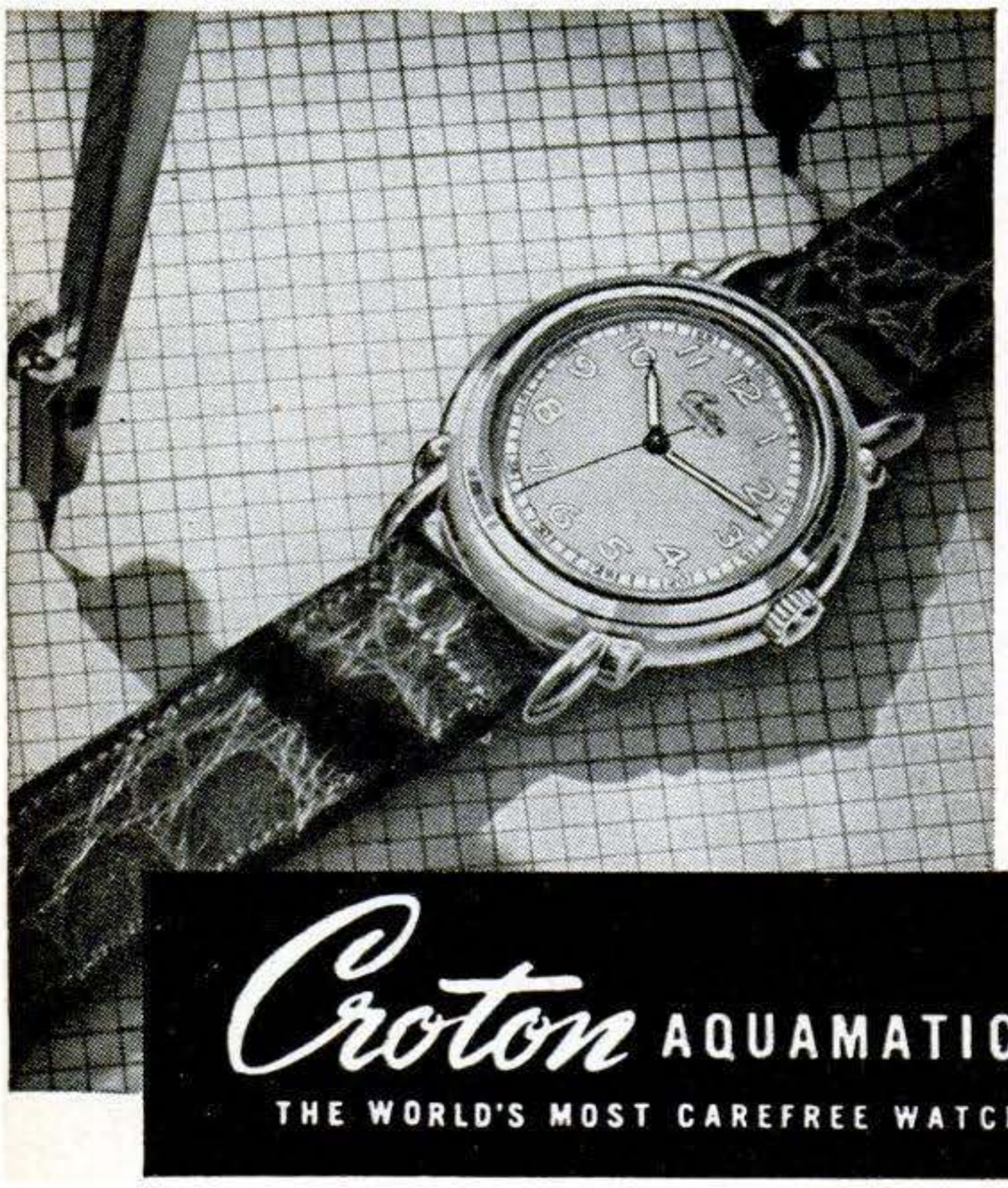
NAME _____
ADDRESS _____
CITY, STATE _____

Copyrighted material

13.5% more accuracy without winding

that's what you get with the

CROTON AQUAMATIC



You're always *on time* because you *don't* wind your watch! Your Croton Aquamatic keeps itself wound just right, by the ordinary motions of your wrist. It can't run down, *can't overwind.* It keeps better time — *13.5% better time** than famous hand-wound watches. The Croton Aquamatic quietly and efficiently tends to its own business, while you go about yours. A wonderful idea for a wonderful gift — or for yourself. Made only by Croton — famous since 1878.

AQUAMATIC SHEDS WATER LIKE A DUCK!

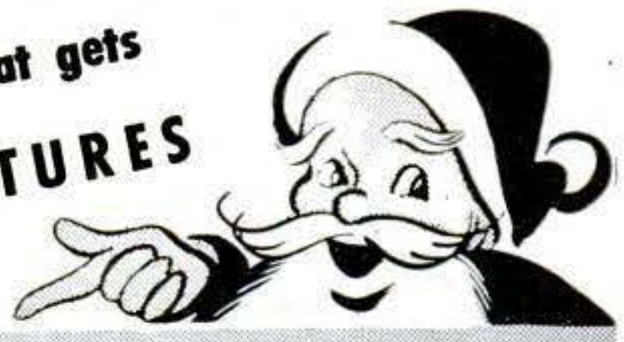
Handsome, serviceable — the Aquamatic is *certified waterproof,* before it goes to your jeweler, by United States Testing Co. Inc. Just make sure *only* your Croton dealer opens, closes and services your watch. Other features — dust-proof, shock-resistant, the dial's easy to read in the dark, *the glass crystal can't shatter!* Only $57.50, including federal tax.

* 3 Aquamatics were tested against the average of 9 famous watches wound by hand, in a 30-day wearing test by a leading laboratory. Aquamatic proved 13.5% more accurate! Write for free booklet. Croton Watch Co., Inc., 48 W. 48th St., N. Y. 19.

© 1947 Croton Watch Co., Inc.

Here's the GIFT that gets

BETTER PICTURES



Type DW-58
Big Value
only
$19.95
Federal tax included

Takes the "guess" out of color shots, movies, stills. Makes sure of correct exposure for perfect pictures. Easy to use. Accurate. Sturdy. Dependable. An *all-year* gift!

NEW Deluxe Type PR-1

Superb gift for expert or beginner. Vest-pocket size. *Remembers* the light it sees . . . pointer lock can't forget! Many other advantages. Ask your photo dealer. Or write for information. *General Electric, Schenectady 5, N. Y.*

$32.50 *Federal tax included*

GENERAL ELECTRIC

606-9

SHOVELS SNOW, SAWS WOOD PLOWS and CULTIVATES

SHAW DU-ALL and 'PEPPY PAL' TRACTORS

These rugged walking and riding tractors pay their way the year 'round. Plows, discs, harrows, hauls, operates lawn mower, cutter bar, spray, bulldozes, plows snow, runs wood saw and other belt machinery.

Ideal for small farms, orchards, truck gardens, poultry farms, golf courses and estates.

Easy to change attachments with improved Jiffy Hitch. Patented tool control allows quick adjustment for wide hills or crooked rows. Sturdy, extra-strength construction means low upkeep cost. Operates for only a few cents an hour.

LOW FACTORY PRICES

Buy direct and save. Mass production holds prices down—quality up. Anyone who has a garden can afford a "Peppy Pal". Write for FREE folders and price list.

SHAW MFG. CO.

5711 FRONT ST., GALESBURG, KAN.
668 PS NORTH 4th ST., COLUMBUS, O.

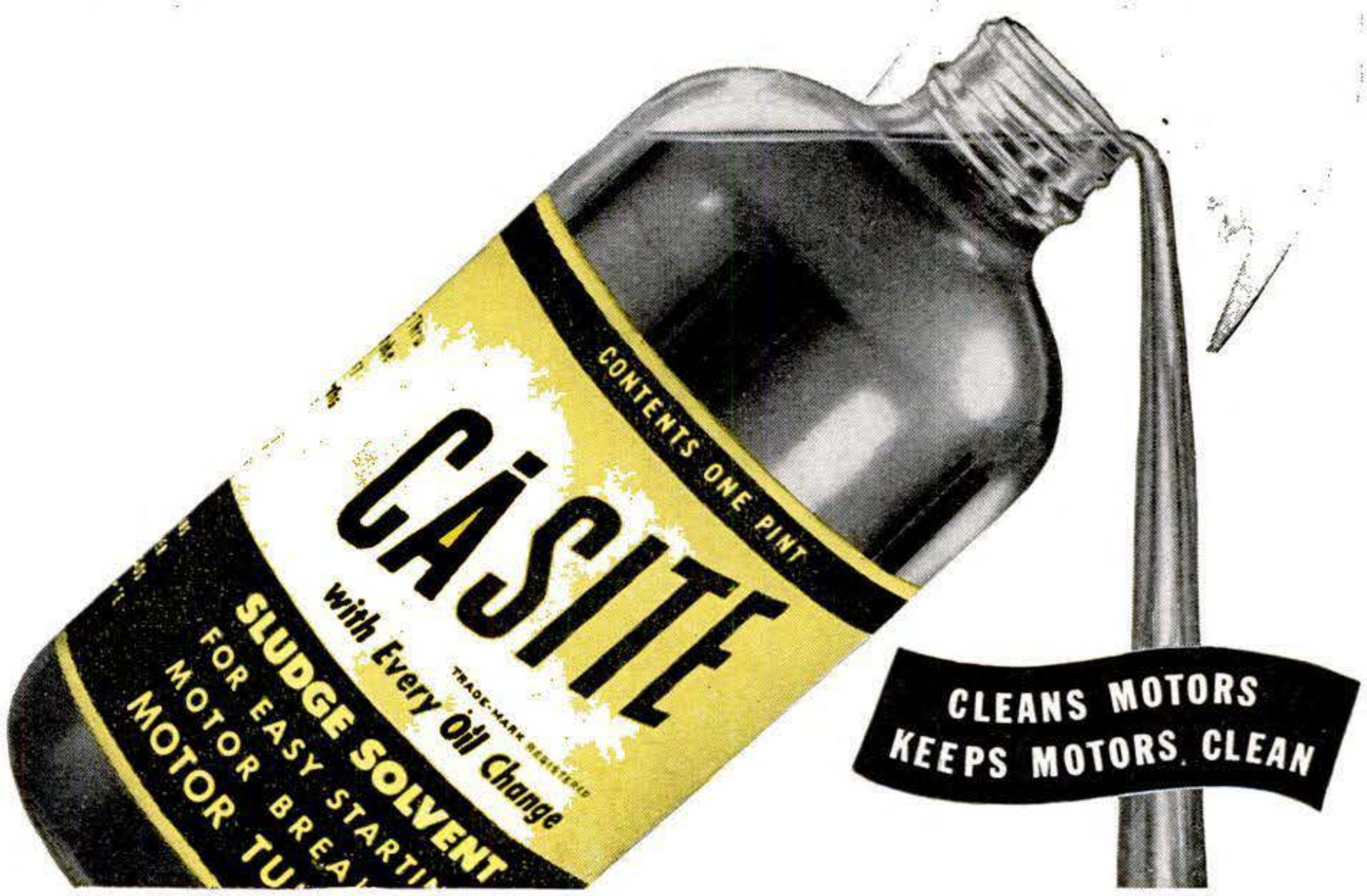
Copyrighted material

Quick Starting all Winter..

or Double-Your-Money-Back

Don't sit out in the cold, grinding down your battery and warming up your temper. Start *fast*—with Casite. It retards congealing of oil . . . lets the motor spin over rapidly . . . *guarantees* quick starting no matter how cold the weather. Casite gives you a smoother performance *all the time*, because it improves lubrication and reduces engine wear. Get Casite at your service station, garage or car dealer's today. The Casite Corporation, Hastings, Michigan, and the Casite Division, Hastings Ltd., Toronto.

75¢
A PINT



CLEANS MOTORS
KEEPS MOTORS CLEAN

Copyrighted material

Here's how to get out of bed!

. . . into a warm, comfortable room! Perfection keeps your home *automatically* warm throughout the night. Just a turn of the dial assures summer comfort for winter mornings . . . all over the house!

There's "Winter-Morning" Warmth with PERFECTION Oil Burning Heaters!

—plus these other advantages—

Uniform Heat—quick radiating and circulating warmth, always there, day or night, when and where you want it.

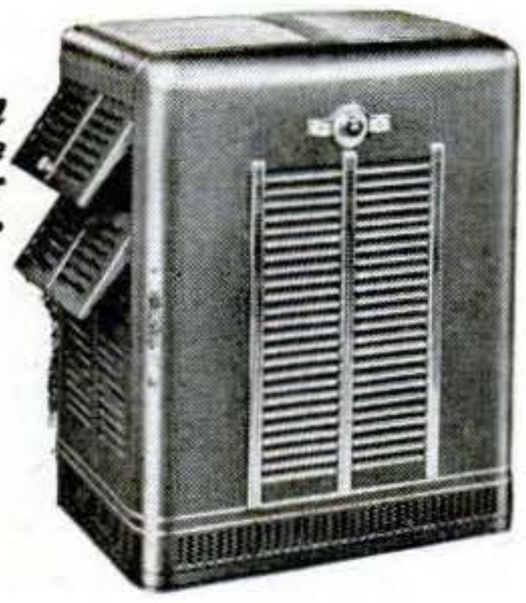
Automatic Control—you can have fully automatic operation with an outside fuel supply tank and Accessory No. 12.

Clean Burning—soot-free, smoke-free, odor-free, result of advanced Perfection engineering over the years.

Blower—addition of Blower No. 24 will carry heat to far corners and other rooms.

Quiet Operation—a silent servant producing the quick, clean comfort of better living.

and—no coal to carry, no fires to build, no ashes to empty, no soot-streaked walls to clean!



Ivanhoe Model 2205 Space Heater, other sizes available.

Firelight Portable Model 750 for "spot" heating anywhere.

PERFECTION

The World's Largest Manufacturers of Oil Burning Appliances for the Home

PERFECTION STOVE COMPANY • 7898-C PLATT AVENUE • CLEVELAND 4, OHIO

Atlanta • Cleveland • Chicago • Jersey City • Kansas City • Oakland • St. Paul

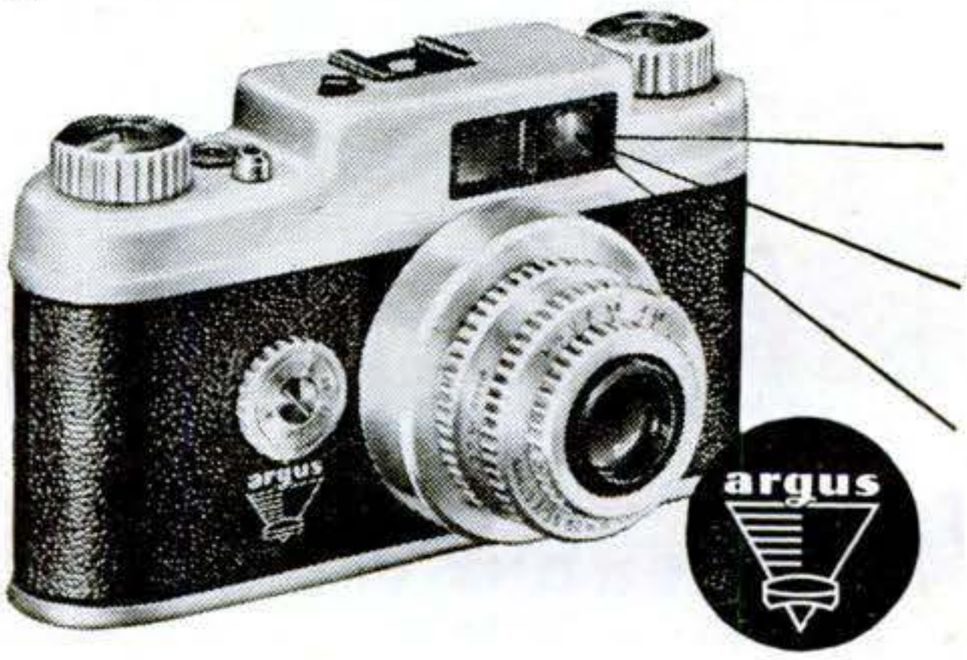
Copyrighted material

You shoot on Sight..

..with argus 21 "Markfinder"

No matter what kind of pictures you like to take—fast-action, panoramas, people or pups—"Markfinder" is the one camera sight that assures accurate aiming, perfect framing, better pictures all the time. Argus 21 with "Markfinder" is the candid camera you won't want to miss, because it is the camera that won't *let* you miss. See Argus 21 with "Markfinder" at your favorite camera dealer's today.

ARGUS, INCORPORATED
ANN ARBOR, MICHIGAN



FASTER!—"Markfinder" center crossmark lines up subject fast and keeps you with it for better action shots.

MORE!—You see more with "Markfinder", because area covered is 25% more than appears on film. Improves composition.

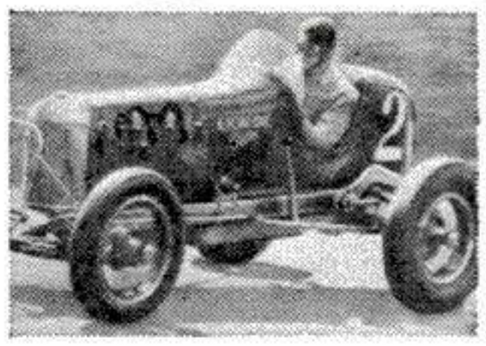
EXACTLY!—You see exactly what your lens "sees" when you use Model 21 with "Markfinder" so you know you always get a better picture.

ONLY ARGUS HAS "MARKFINDER"

Copyrighted material

PICTOREEL
HOME MOVIE HITS YOU CAN OWN!

GOOD NEWS FOR PROJECTOR OWNERS!



DEVIL DRIVERS

Auto-racing thrills of ten films in one! Swerving juggernauts...fearless drivers...in roaring races over world-famed tracks. Smash thrills of the Indianapolis meet! (No. 123)

BUCK CHEEZER

Whiz out to the moon in Buck Cheezer's 25th Century rocket-plane. Chuckle-filled comedy amid the planets! (No. 116)

UNDERWATER

Revealing show of underwater beauty and sport! See archery, exploring, spear-fishing, water polo thrills filmed so perfectly you'll marvel at miracles of photography! (No. 130)

FREE! Your de-luxe new PICTOREEL catalog of sound and silent home movies is ready. Send for it!

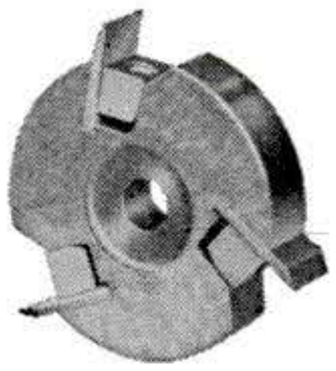
Please send the home-movies checked below.
I enclose remittance ☐ Send C O D ☐

	COMPLETE			STREAMLINER	
	16 snd	16 sil.	8mm	16mm	8mm
	$17.50	$8.75	$5.50	$2.75	$1.75
DEVIL DRIVERS					
UNDERWATER					
BUCK CHEEZER	STREAMLINER ONLY				

*Name*_____
*Address*_____
*City*_____ *State*_____

PICTORIAL FILMS, Inc.
625 MADISON AVE., NEW YORK 22, N. Y.

TABLE SAW ATTACHMENTS



Immediate Delivery

fit any saw . . .
SHAPER HEAD

fits ½", ⅝" or ¾" shaft . . . three 1" wide hardened and ground high speed steel knives furnished. other shapes available. Body is cast steel, precision made and balanced. When ordering specify side of saw (when facing saw) shaper is to fit. 3⅞" diameter size..... **$14.95**
4½" diameter (hole size to 1"), prepaid..... **$16.95**

GROOVE-MASTER

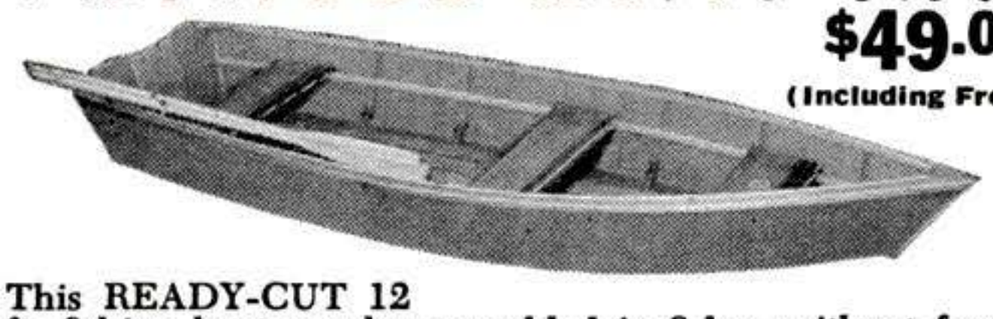
for grooving, dadoing, tenoning, etc. Cuts with or against grain. 5½" dia. with ⅝" or ½" shaft hole. Set consists of two—3/32" thick outside saws plus six—1/16" thick inside filler cutters, prepaid..... **$5.95**

Money Back Guarantee: these attachments are guaranteed as advertised and as to quality or your money back.

—ORDER DIRECT—
UNIVERSAL TOOL CO.,
919 E. Redondo Blvd., Inglewood, Calif.
Send me the following postage prepaid.
☐ SHAPER HEAD.....Diameter.....Hole Size.....Size of Saw
☐ GROOVE-MASTER Dado Set.....dia. hole
☐ I enclose.....in check or money order
☐ Ship C.O.D.. deposit of $1.00 enclosed on each item ordered

NAME.....
ADDRESS.....
CITY.....STATE.....

PLYWOOD BOAT KITS
$49.00
(Including Freight)



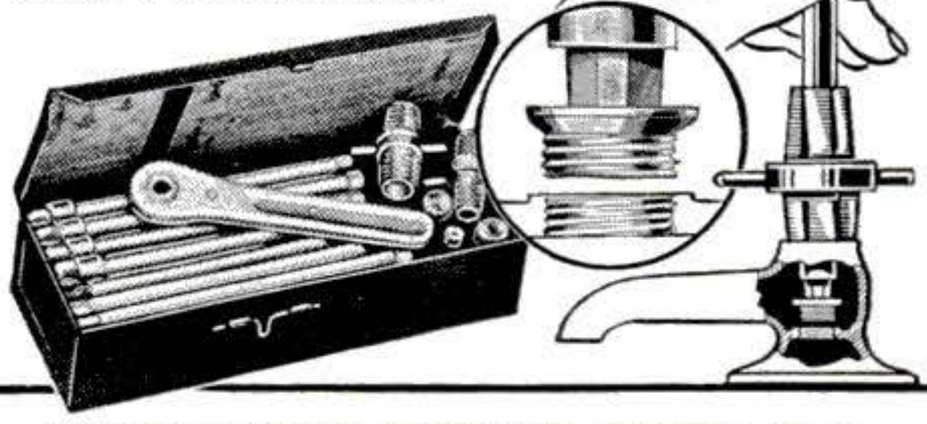
This READY-CUT 12 ft. fishing boat can be assembled in 8 hrs. without forms or special tools. Kits are complete including all hardware, paint, and etc. Send for free folder.

TAFT MARINE WOODCRAFT
Dept. K 636 39th Ave. N.E. Minneapolis 13, Minn.

STOPS LEAKS *PERMANENTLY*

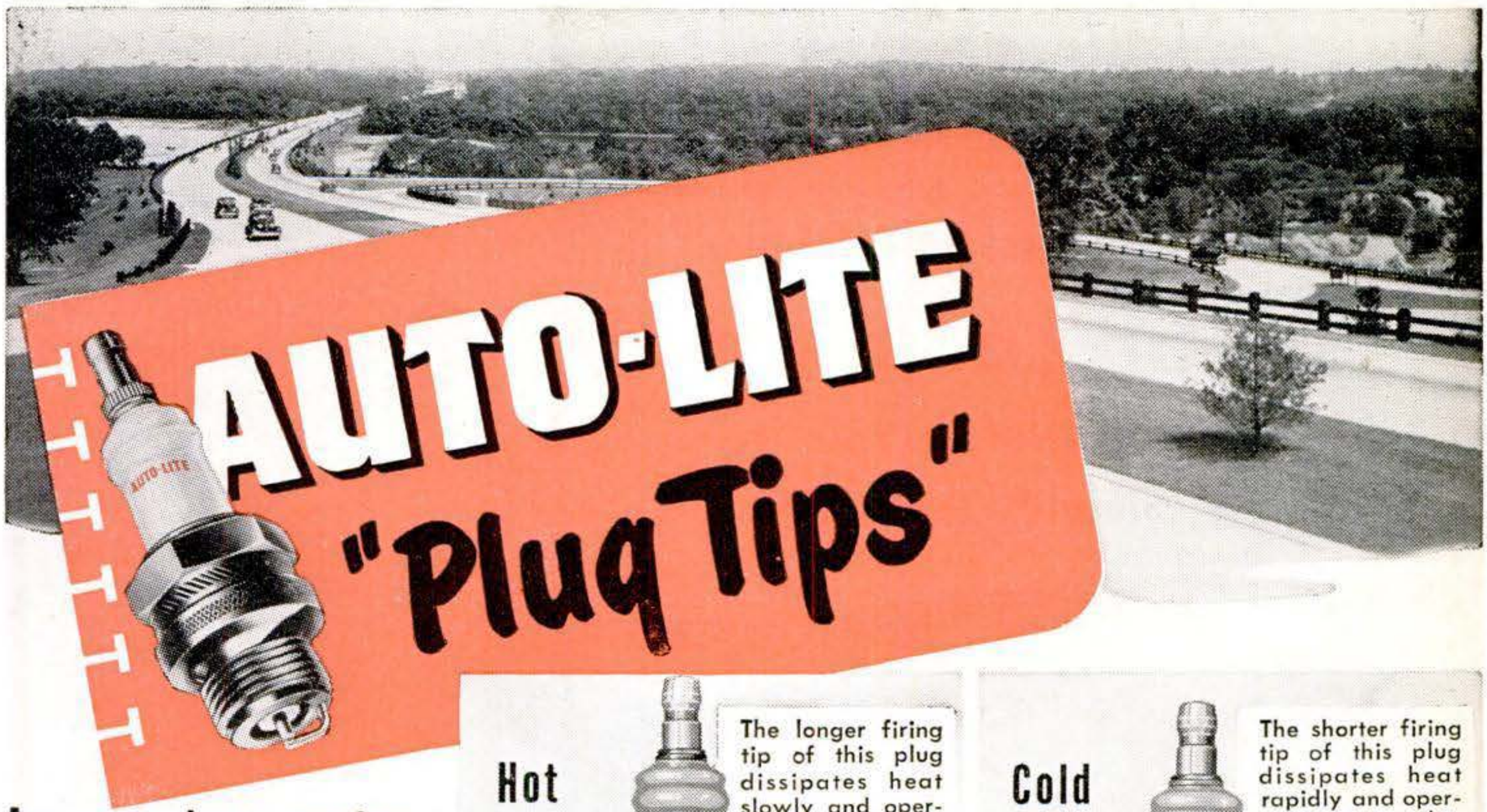
Cut your fixture replacement, water and fuel bills with Economy Renewable Seats. Make economical, permanent repairs quickly and easily with the Junior Kit (illus.). Repair bathroom, kitchen and laundry fixtures. Everything you need included in steel box. This is a natural for the "Fixit" shops—get extra income from making permanent repairs on your customers' faucets.

Senior Master Kit also available—repairs faucets and valves up to 1" pipe. *At better Jobbers and Hardware Stores . . . or Write Direct.*



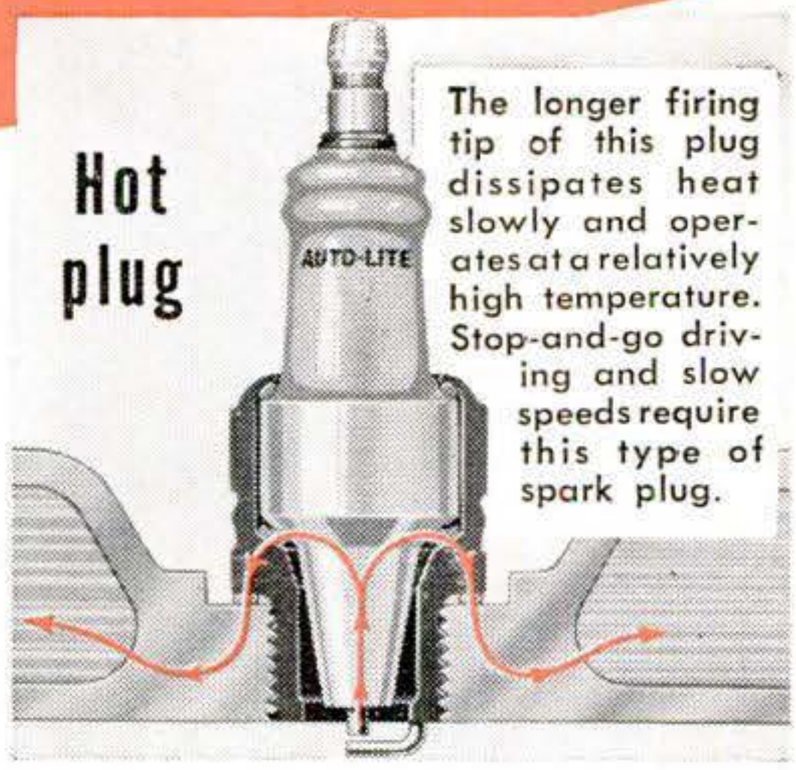
ECONOMY VALVE SEAT CO.
2811 W. Fletcher Street Chicago 18, Ill.

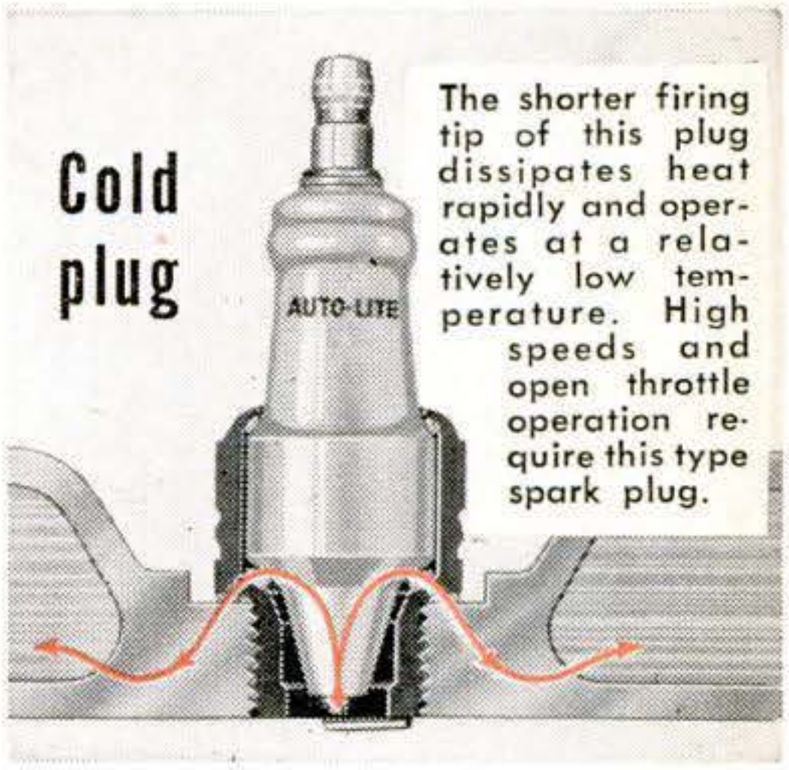
Copyrighted material



Are your plugs wasting time and money?

The right type of spark plug will save you time and money. Plugs which are faulty and mis-fire waste as high as 10 per cent of your fuel, according to experts. And hard-to-start engines can lose valuable time. Check all your spark plugs regularly to make sure you have the right plugs for your engines.





Send for Auto-Lite "Plug-Chek" kit...only 10¢!

Too Hot *

If spark plug firing tips are fused or blistered, plugs are operating too hot and may be causing loss of power and damaging spark knock.

Normal *

If spark plugs look like this, they are of correct heat range. Get your Auto-Lite "Plug-Chek" Kit right now and check your spark plugs.

Too Cold *

If spark plug firing tips show deposits of carbon or are wet with oil, plugs are too cold, may cause poor starting and waste dollars in costly gas.

This Auto-Lite "Plug-Chek" Kit quickly helps you find spark plugs that are causing trouble. All you do is match plugs with pictures on the "Plug-Chek" Indicator—each example refers to a page in the "Plug-Chek" Data Book that shows you what to do.

** Because these illustrations are not in full color, they do not accurately reproduce the actual firing tip appearance. For accurate, full color reproduction, mail the coupon.*

Switch to
AUTO-LITE SPARK PLUGS

THE ELECTRIC AUTO-LITE COMPANY
Department PS2, Toledo 1, Ohio

Enclosed find ten cents for the Auto-Lite "Plug-Chek" Kit that includes both the "Plug-Chek" Indicator and Data Book.

Name_____

Address_____

City_____

Copyrighted material

Ingenious New Technical Methods

To Help You Simplify Production

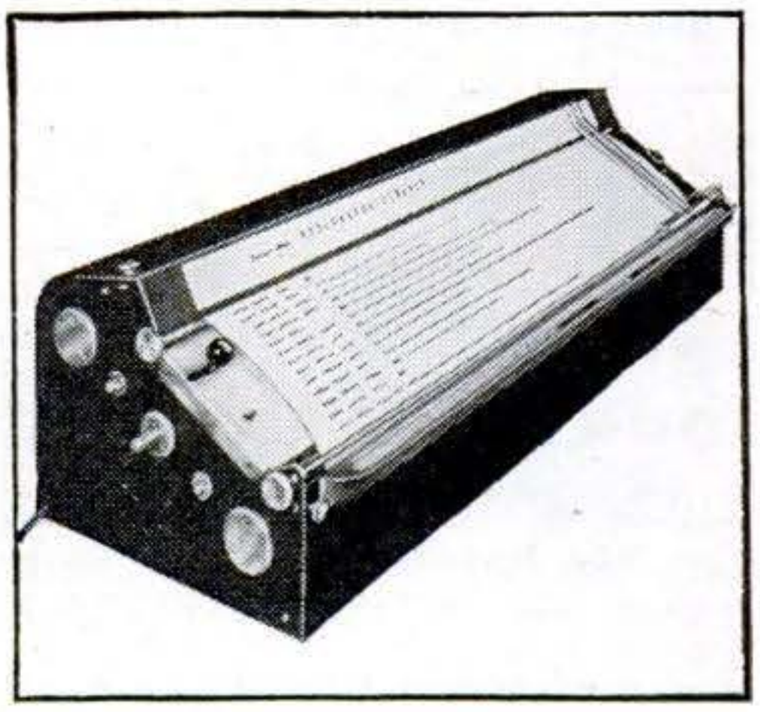
New Automatic Device Provides Up-to-the-Minute Visual Record

The new CHART-O-MATIC provides an instant visual record of all production, shipments, purchases, absenteeism, etc. Avoids inventory surpluses. Guides purchasing department giving constant picture of all parts and supplies on hand. Requisitions can be made direct from chart. Information from all departments transmitted to operator by Telautograph permits instant recording on CHART-O-MATIC. Does away with big wall charts and card-systems and tedious, time-consuming search for data that is often far from current. With the CHART-O-MATIC, the complete activities of the entire plant can be determined in an instant.

The entire unit is easily portable and operates from 110 volts current. Chart rotates in either direction by finger-tip control. Speed may be governed by rheostat.

New devices are proving their worth in saving time and reducing nervous tension on the job. And modern plants throughout America are finding that chewing gum on the job helps relieve monotony and helps to keep workers alert. That is why more plants every day are making Wrigley's Spearmint Gum available to their employees.

Complete details may be obtained from Spiral Mfg. Corporation, 3612 N. Kilbourn Avenue, Chicago 41, Illinois.



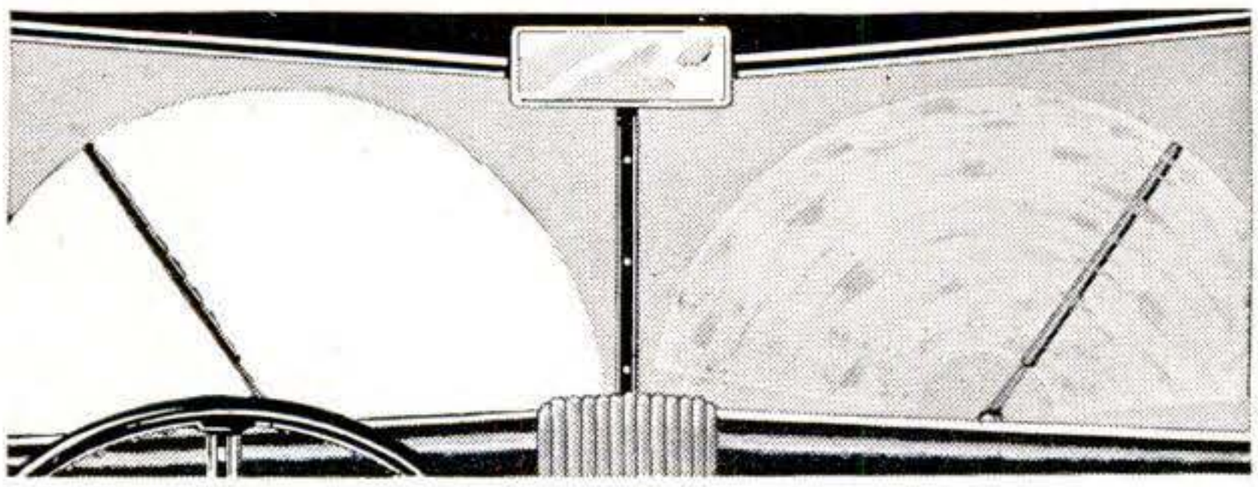
The New Chart-O-Matic

AB-78

Copyrighted material

AMAZE YOURSELF as our "guest"...with this CONTRASTING DEMONSTRATION on your own car

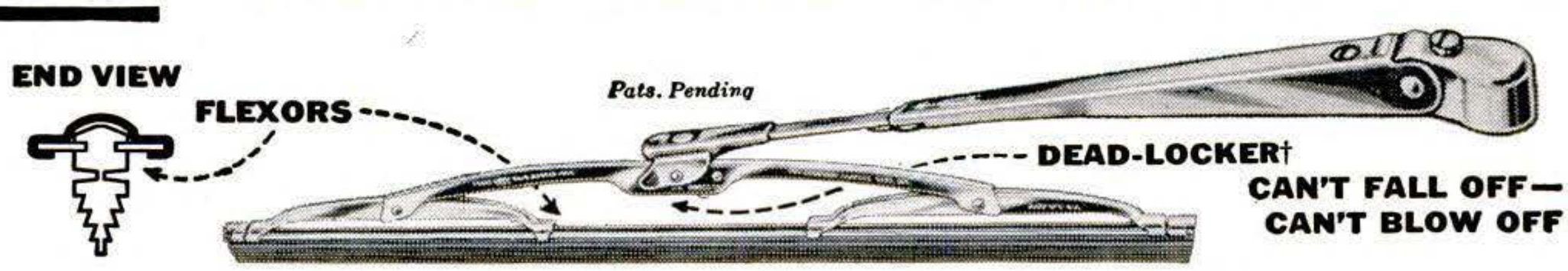
CLEAR - FLEX CLEARS!



OLD BLADE SMEARS?

Prove that your WINDSHIELD . . . like all others . . . has LOW SPOTS . . . hard to wipe clearly . . . using ANYTHING BUT the NEW . . .

ANCO† CLEAR-FLEX‡ WINDSHIELD WIPER BLADE



FLEXES TO CLEAR THE LOW SPOTS

Know CLEAR-FLEX . . . the first Wiper Blade to conform fully to all windshield surface irregularities. Even wipes uniformly all types of curved windshields. Keeps clear those annoying hard-to-reach low spots common to all FLAT windshield glass. Clears quickly . . . WITHOUT HELP . . . blinding road muck . . . slapped against your windshield . . . from sloppy pavements . . . by passing cars. CLEAR-FLEX already has engineering approval for original equipment on coming models of high-grade cars.

COSTS LESS TO USE

CLEAR-FLEX ECONOMY REFILLS quickly MAKE LIKE NEW . . . at your gas pump . . . when rubber finally becomes worn or damaged. Holder OUTLASTS your CAR.

YOU WIN THIS WAY

Simply ask your good gas-pump man . . . next time you buy gas . . . to install for you . . . quickly . . . out on the driver's half of your windshield . . . one ANCO Clear-Flex Wiper Blade. Deposit with him only the regular price . . . printed on its box. Keep your old Blade . . . if you like.*

THE CONTRAST TELLS

Leave untouched the used Blade and Arm on your OTHER wiper shaft . . . until you compare it with CLEAR-FLEX performance . . . in the next storm! You are delightfully amazed . . . by CLEAR-FLEX. *Eye-strain . . . jangled nerves . . . FILM FATIGUE . . . GONE!* You enjoy at last the relaxed comfort . . . and added safety . . . of crystal-clear driving vision.

YOUR MONEY BACK QUICKLY —IF YOU'LL TAKE IT!

If you then are willing to part with your ANCO Clear-Flex Blade . . . the dealer who put it on for you is authorized by us to remove it . . . put back your old Blade . . . and refund pleasantly every cent you deposited for CLEAR-FLEX. We protect him in that. Show him this ad. You risk no money. Get yours today. Try it. Then make it a PAIR. May save you a costly smashup!

ANCO DEAD-LOCKER WIPER ARMS

***—Use CLEAR-FLEX Blade ONLY with the sturdy ANCO Dead-Locker Arm . . . already on millions of cars. ANCO Arm fits quickly any wiper shaft. Suits any good wiper motor. Holds Blade true . . . at correct pressure. If not now on your car, ask serviceman to install a PAIR quickly for you. More than 250,000 good gas stations and service stores sell ANCO BETTER Blades and Arms.**

Made by the makers of long-famous ANCO RAIN-MASTER† Blades and Arms . . . original equipment for years on DeLuxe models of high-grade cars. Your dealer knows ANCO.

†Trade Mark Reg. U. S. Pat. Off. ‡Trade Mark of—The Anderson Company

Quality Protected Under Fair Trade Laws—ANCO Patented Products—Patents Make Jobs

THE ANDERSON COMPANY

Established 1918

GARY, INDIANA

Copyrighted material

THE FAITHFUL HEART OF YOUR FUEL SYSTEM

AC FUEL PUMPS

Pulsing steadily, hundreds of times a mile, your AC Fuel Pump is the strong, reliable heart of your fuel system. It has given you long, faithful service because of its inbuilt quality and scientific design.

You can prolong that faithful service indefinitely, if you insist upon an AC when you replace your present pump with a new or rebuilt one.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

Foredom PRESTO-FLEX

NOW! For Only $5.95 You can have an Amazing New FLEXIBLE SHAFT TOOL

with PENCIL-SIZE HANDPIECE

Grinds, Polishes, Sharpens, Cleans, Mills, Carves, Engraves, Etches on Metal, Wood Glass, and Plastic

Now you can turn your old motor, drill press, or electric drill into a Flexible Shaft Tool. Amazing new Presto-flex, latest addition to the Foredom flexible shaft family. Simply attach to your electric drill, drill press or motor. **Presto**—a flexible shaft machine! Off again in a jiffy! Pencil size handpiece gives you finger-tip control. Gets into tight places you can't reach with any other tool. Handy 35" overall length. And—only $5.95 complete! Order NOW.

SEND NO MONEY

Just send your name and address. We will rush your **Presto-flex** COD. Pay postman $5.95 plus postage or send $5.95 now and WE pay postage. Money back if not **delighted!** If you order **Presto-flex** for use on motor, specify motor shaft diameter and add 50c for motor coupling. (Available for 1/4", 5/16", 3/8" and 1/2" shafts.) 50 piece accessory set available $1.50 extra. Order TODAY from

FOREDOM ELECTRIC CO. Dept. 135

Manufacturers of Flexible Shaft Equipment for Home and Industry For a Quarter Century.

27 PARK PLACE • NEW YORK 7, N. Y.

MOTORS

110 v. AC—Heavy Duty CONSTRUCTION

Fractional H.P. ball bearing
New—Ideal for power tools, fans, models, etc.
Prices F.O.B., N.Y.C.
Remit 20% Bal. C.O.D.

$4.95

MANUEL KLEIN 74P CORTLANDT ST. NEW YORK 7. N. Y.

U. S. NAVY 7x50 PRISM BINOCULARS

with Coated Optics

Used but in EXCELLENT CONDITION

$139.50 Tax Included

Complete with leather carrying case and sling

Engineers All Metal Army Type Hand-Sighting LEVELS

$2.00 *PRECISION QUALITY*

Send $1.25 for 3rd Edition of Gun Digest with our complete catalog of new and used guns, etc. Our separate catalog 25c.

PUBLIC SPORT SHOPS

13 S. 16th St., Phila. 2, Pa. No COD's

Copyrighted material

The Sensational New Dumore Duplex

makes your work easier, faster and twice the fun!

Flexible-shaft attachment doubles the usefulness of your Duplex.

The Duplex can handle 1001 different jobs as a hand tool.

Bench stand converts your Duplex into a third tool.

With a toolpost bracket, your Duplex serves as a lathe-grinder.

If you want a good handgrinder — get a Dumore!

Here's the handgrinder you've always wanted for your workshop—the tool that gives you *more* of everything you want, than any other handgrinder. Its full 1/14 HP motor has the extra power for "heavy" jobs. Its extra-capacity chuck takes all 3 tool sizes—1/4", 1/8", 3/32".

With a simple, easy-to-use attachment, your Duplex becomes a flexible-shaft tool. Other attachments convert it instantly for bench or lathe work.

Think what you can do with the extra power, capacity, and versatility of the Dumore Duplex! Work in wood, metal, and plastics is faster, easier—and twice the fun! And the Duplex costs no more than an ordinary handgrinder: 27-accessory Deluxe Kit—$27.50; 9-accessory Standard Kit—$19.75; flexible shaft and other attachments extra.

The powerful Duplex is the perfect gift for any hobby-minded man or boy. See it in your local hardware store today—or send in the coupon below!

Satisfaction guaranteed — or your money back in 10 days!

Tear out this coupon and mail today!

The Dumore Company, Dept. L-52, Racine, Wisconsin

- ☐ Please send complete information on Duplex Grinder.
- ☐ Send me Deluxe Duplex Kit (27 accessories); $27.50 enclosed.
- ☐ Send me Standard Duplex Kit (9 accessories); $19.75 enclosed.

Shipping charges C.O.D.

Name_____

Address_____

City_____ (_____) State_____

H-7

Copyrighted material

NOW TRY Dustless SWEEPING

Reduce Germ Laden Dust Eliminate Sweeping Compound

Dustless brushes used with Arbitrin sweeping fluid eliminate up to 97% of germ laden dust and reduce sweeping costs 20%. Arbitrin fluid, poured into a metal reservoir in the brush back, filters through the tufts and keeps dust down as you sweep. Dustless brushes are used in thousands of schools, factories, offices, stores, and institutions. There is a Dustless brush to fit your needs. Write for sizes, styles and prices today.

MD

Milwaukee Dustless Brush Co.
530 N. 22nd St., Milwaukee 3, Wis.
Please send complete facts about Dustless Brushes.

Name _____

Street Address _____

City, State _____

NEW! Tru-Turn

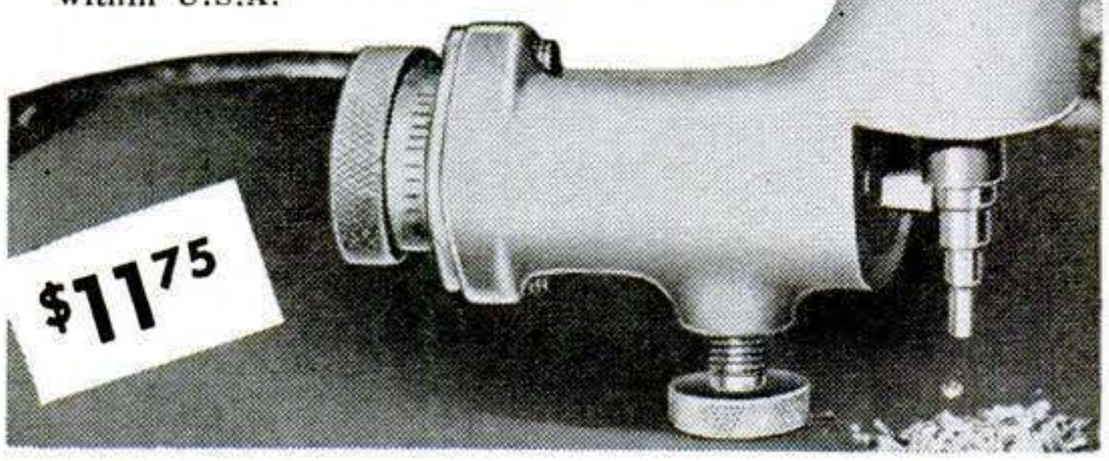
IDEAL CHRISTMAS GIFT

Every home craftsman wants to work metal. Now he can . . . without buying large, expensive equipment. The new TRU-TURN TOOL converts drill presses, grinder stands and woodturning lathes into PRECISION metal lathes. TRU-TURN has a built-in micrometer . . . is suitable for commercial shops. Beginners can produce work with a high-grade finish immediately. Turns and cuts-off steel, brass, aluminum.

TRU-TURN TOOL—Two guide bushings; and bits for steel, brass, aluminum . . **$11.75**

FACE-PLATE WORK-DRIVING CHUCK—For converting woodworking lathe. Chuck and three adapter bushings **$4.50**

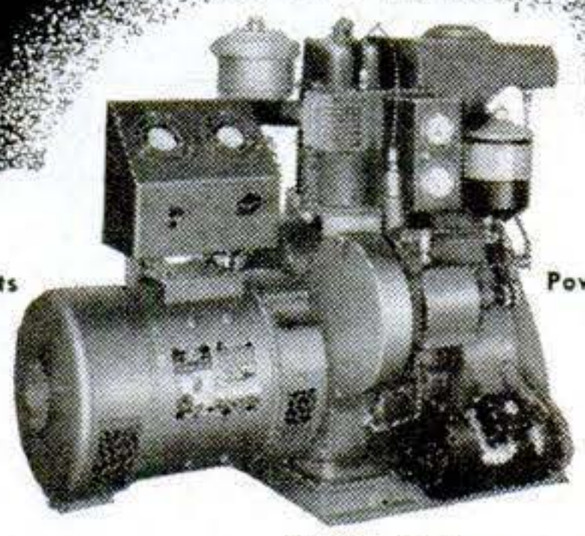
Add 25c to each item for C.O.D. orders. Send money orders or checks for prepaid shipment within U.S.A.



MILLHOLLAND SCREW PRODUCTS CORPORATION
132 West 13th Street, Indianapolis 2, Indiana

Sheppard

AIRCOOLED DIESEL POWERED GENERATING SET . . .



Generating sets to 36 K.W.

Power units to 62 H.P.

Saves as it Serves

This 2,000 watt Sheppard unit delivers steady, *dependable* current for about 1¢ per K.W. hour. Powered by an *aircooled* Sheppard diesel, it operates on low-cost domestic furnace oil.

It's the ideal power source for water systems, refrigerators and home-lighting . . . or wherever economy is important without sacrificing dependability. Write for complete information—see how a Sheppard Diesel Generating set saves as it serves.

R. H. SHEPPARD CO., INC., 68 Middle St., Hanover, Pa.

DIESEL'S THE POWER . . .
Sheppard's the Diesel

Copyrighted material

Motorcycling

world's greatest sport –

Ever zip over a hill with the fresh morning air in your face, a companion clinging tight and happy laughter ringing in your ears? Ever feel the thrill of swinging down a beautiful country road on a swift, sleek Harley-Davidson that seems alive with power and anxious to go places? Ever hear the roar of races, hillclimbs and other spine-tingling events that only motorcycling provides? Ever join a jolly caravan of riders on a sight-seeing tour of scenic wonderlands, out-of-way places, distant cities? If you haven't, you're missing the world's greatest sport—motorcycling! And it's so *easy* to enjoy . . . easier to own a Harley-Davidson than you think. See your dealer today. Mail coupon now!

HARLEY-DAVIDSON
Motorcycles

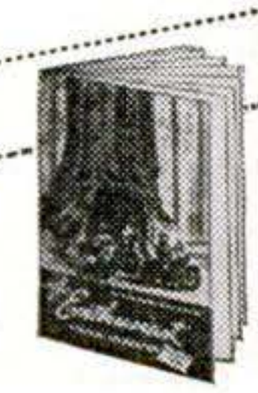
HARLEY-DAVIDSON MOTOR CO.
Dept. PS, Milwaukee 1, Wis.

Send free copy of ENTHUSIAST Magazine, filled with thrilling motorcycle action pictures and stories; also literature on 1948 models.

Name.....

Address.....

City..... State.....



Copyrighted material

HOME WORKSHOPPERS

Here are two tools that belong on every bench.

Better tools mean better work, greater skill — and more fun in the working.

At Your Local Hardware Dealer's

Send for descriptive folder. Coupon below for your convenience.

Faithful Since *Quality 1870*

BERNARD

TRADE MARK REGISTERED

WM. SCHOLLHORN CO., 7011 Chapel St., New Haven 9, Conn.

Sirs: Please send me your folder of BERNARD hand tools.

Name .....

Street .....

City ..... *Zone No.* ..... *State* .....

SURPLUS SPUR GEAR HAND HOIST

LIFTS, as a hoist...or pulls, as a winch. Hundreds of uses for this converted bomb hoist. Made by famous manufacturer for Uncle Sam . . . Brand new, unused.

Easily lifts or pulls up to 350 pounds. 20 ft. of multi-strand wire rope can be fed out of any one of three drum housing openings.

Rig it up yourself on wall, beam, tripod or trolley, wherever you want to lift or pull heavy or bulky loads, such as boats, outboards, stock . . . anything too heavy to handle. Free illustrated "How To Use It" suggestions.

•

LIMITED QUANTITY *at never-again price of:*

$9.95

Postpaid in U.S.A.

IRELAND & VICE P. O. Box 146-B, Auburn, N. Y.

Fill Holes, cracks, dents, gouges . . .

These BETTER FILLERS

- HARDEN FASTER
- SHRINK LESS
- STAY IN!

Duratite Wood Dough will fill rough or irregular cavities in wood, metal, plastic or plaster in *one* application. (Duratite Surfacing Putty for shallow cavities). Can be sawed, cut, milled, sanded; are waterproof, fire resistant. Seven wood colors, in tubes or cans, at Hardware and Paint stores.

Only 25c for large tube of Wood Dough and interesting booklet. Write

LARGE TUBE 25c Postpaid

WEBB PRODUCTS CO.

232 South G Street, San Bernardino, California or Webb Company • Dept. S • Norcross, Georgia.

DURATITE

WOOD DOUGH AND SURFACING PUTTY

Copyrighted material

NO WORKSHOP IS COMPLETELY EQUIPPED WITHOUT

BOTH THESE DREMEL ELECTRIC POWER TOOLS

IT'S BACK
MOTO-SAW

THE AMAZING ELECTRIC SCROLL SAW

7,200 Strokes Per Minute

JUST GUIDE IT

Only **$5.85** COMPLETE With 3 Saw Blades POSTPAID

AVERAGE CUTTING SPEED ONE FOOT PER MINUTE

Boys from 8 to 80 (and girls, too) have fun with a Moto-Saw . . . it works more like magic than any tool you ever saw! Takes no effort to run, no perceptible pressure to feed . . . only a trifle heavier than a hand scroll saw, and better balanced in your hand. Runs 7,200 strokes a minute . . . leaves no rough edges . . . easily cuts intricate scroll designs in medium-hard wood up to ¾" thick. Blade holder faces blade 4 ways . . : permits sawing sideways as well as forward and backward. No limit to length of stock it will cut . . . saws to center of 19" widths. Plug into any 110-120 Volt, 50 or 60 cycle alternating current outlet (does not operate on direct current). **See Dremel Moto-Saw at your dealer's.** If he cannot supply you, use coupon below to order on 10 day, money-back trial.

AS SAFE AS A HAND SAW

The versatile Moto-Saw is as safe as a hand saw . . . a touch of the trigger switch sets it going . . . releasing stops it instantly. A thrill awaits you when you first feel the hang of Moto-Saw in your hand and sense its surge of precision power. Sturdily constructed . . . only two moving parts . . . never needs oiling . . . requires no bench room or floor space. Thousands of satisfied users.

IMPROVED
MOTO-TOOL

"THE POCKET-SIZE MACHINE SHOP"

Look at the rest . . . then buy the best! Only Moto-Tool offers about 27,000 R.P.M. (the speed necessary to conserve cutters, do fine work). Owners declare Moto-Tool the handiest tool in the home or shop . . . find new uses for it daily.

Approx. 27,000 R.P.M.

14 REASONS WHY MOTO-TOOL IS A BETTER BUY

- Housing has "pencil-type" finger grip.
- Instant-action, wrenchless chuck.
- Patented automatic chuck-lock pin.
- 110 Volt universal type (A. C. - D. C.) motor.
- Easily replaced commutator brushes.
- Oversize armature shaft; hardened, ground and polished.
- Oil-less (sealed), trouble-proof bearings.
- About 27,000 R.P.M. Cuts cleaner . . . saves cutters.
- Dynamically balanced for vibrationless operation.
- Dust-filtered air-cooling system.
- Sturdy, shock-proof bakelite housing.
- Sliding, snap-type switch.
- Handy hanger hook; cord protector.
- Weighs only 13 oz. . . . shaped to fit the hand.

MODERN CRAFTSMEN'S KITS

Pre-War Prices Still Prevail

Moto-Tool Kit No. 2, with 23 accessories (high-speed steel cutters, grinding wheels, polishing accessories) and heavy-duty professional Model 2 Moto-Tool in natural-finish, hardwood case . **$23.50** (Items purchased separately would cost about $30.00; you save $6.50.)

Model 2 Moto-Tool, with one emery point **$16.50**

Moto-Tool Kit No. 1, with 34 accessories and Model 1 Moto-Tool in wood case **$17.50**

Model 1 Moto-Tool, with one wheel point **$9.85**

MONEY-BACK GUARANTEE: Buy Dremel Moto-Tool from your dealer. If he cannot supply you, order direct from the factory on 10 day trial. Shipped postpaid for payment in full (send check or money order); or send only $2.00, we will ship C.O.D. You pay balance plus postage.

DREMEL MFG. CO. • DEPT. 127-L • RACINE, WIS.

IF YOUR DEALER CANNOT SUPPLY YOU, *USE THIS COUPON TO ORDER*

DREMEL MANUFACTURING CO. • DEPT. 127-L • RACINE, WISCONSIN

☐ Enclosed find $. . . . . (Check or money order). Ship items checked below at once Postpaid.
☐ Enclosed find $2.00 as part payment on items checked. I will pay postman balance plus postage upon C.O.D. delivery.

☐ Moto-Saw, with 3 blades **$5.85**
☐ . . . . . dozen blades (**60c** per doz.)
☐ Moto-Tool Kit No. 1, **$17.50**
☐ Model 1 Moto-Tool, **$9.85**
☐ Moto-Tool Kit No. 2, **$23.50**
☐ Model 2 Moto-Tool, **$16.50**
☐ Universal Stand, **$4.50**
☐ Shaping Table, **$2.50**
☐ Free Catalog

NAME. . . . . ADDRESS. . . . . .

CITY. . . . . ZONE. . . . . STATE. . . . . .

Copyrighted material

How would you like to build and own the "Sea Pup"?

The "Sea Pup" is the first in a new series of boat plans, designed exclusively for Cascophen by William F. Crosby, creator of the famous "Snipe" and "Seagull."

She can be rowed, sailed, or powered with a light outboard. She's 12' long, 4'5½" beam, seats 2 to 4.

And here's the Pay-off!

Plans for the "Sea Pup" retail at only $2.50 a set and consist of 5 easy-to-read 24" x 30" blueprints. They include: Complete bill of materials and specifications for hull, hardware, rigging and fasteners . . . all lines and offsets, profiles and sections, construction plans and detail drawings.

Exclusive of lumber, you can build the "Sea Pup" for about $50.00 including the price of the hardware, rigging, paint, glue, and equipment.

Start now! Get the "Sea Pup" plans at your local marine supply dealer's. Or mail coupon today.

CASEIN COMPANY OF AMERICA
Dept.PS17,350 Madison Ave., N.Y. 17
Please send me a complete set of plans for the "Sea Pup" at the regular retail price of $2.50.

Attached is my Check_____
Money Order_____ Cash_____

Name_____
Address_____
City_____
Zone_____ State_____

CASCOPHEN

Durable Resin Glues for Boats

"You can really solder with a G-E Handy Iron"

THAT'S what Mr. ReQua says about his G-E Handy iron. "It gives fast, continuous heat, lets me solder rapidly," he states. "It's ideal for the average repair job around the house. The more I use it, the more I like it."

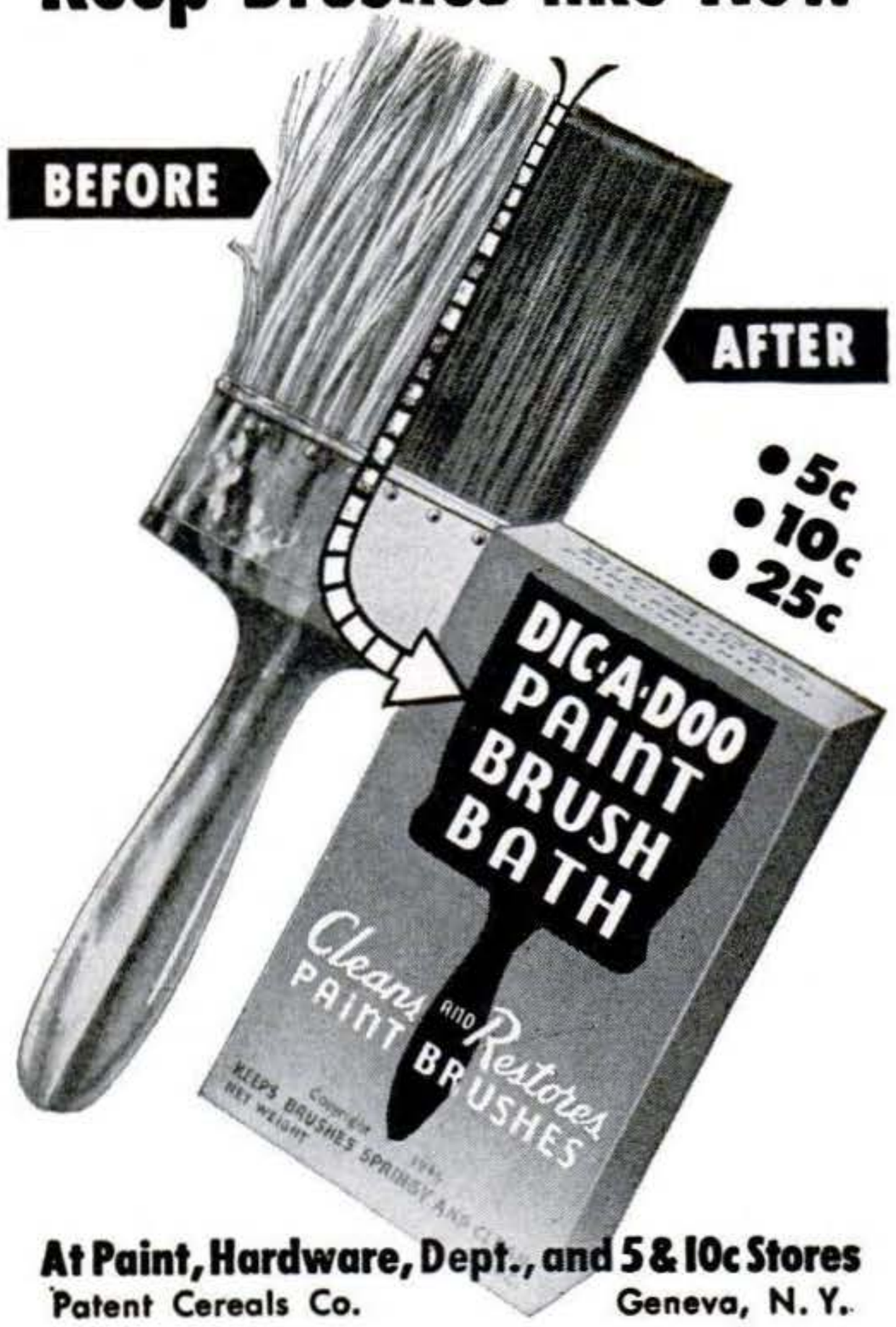
Mr. ReQua has reason to like his Handy iron. For it has same design as G-E industrial irons, yet is lightweight, easy to use, built to last. See the G-E Handy iron at your dealer's today. If your dealer does not have them order direct, giving us your dealer's name. *Department 667-4, Apparatus Department, General Electric Co., Schenectady, N. Y.*

Free: *"How to solder" manual with every iron.*

George ReQua, hobbyist and home craftsman.

GENERAL ELECTRIC
667-4

Keep Brushes like New



At Paint, Hardware, Dept., and 5 & 10c Stores
Patent Cereals Co. Geneva, N. Y.

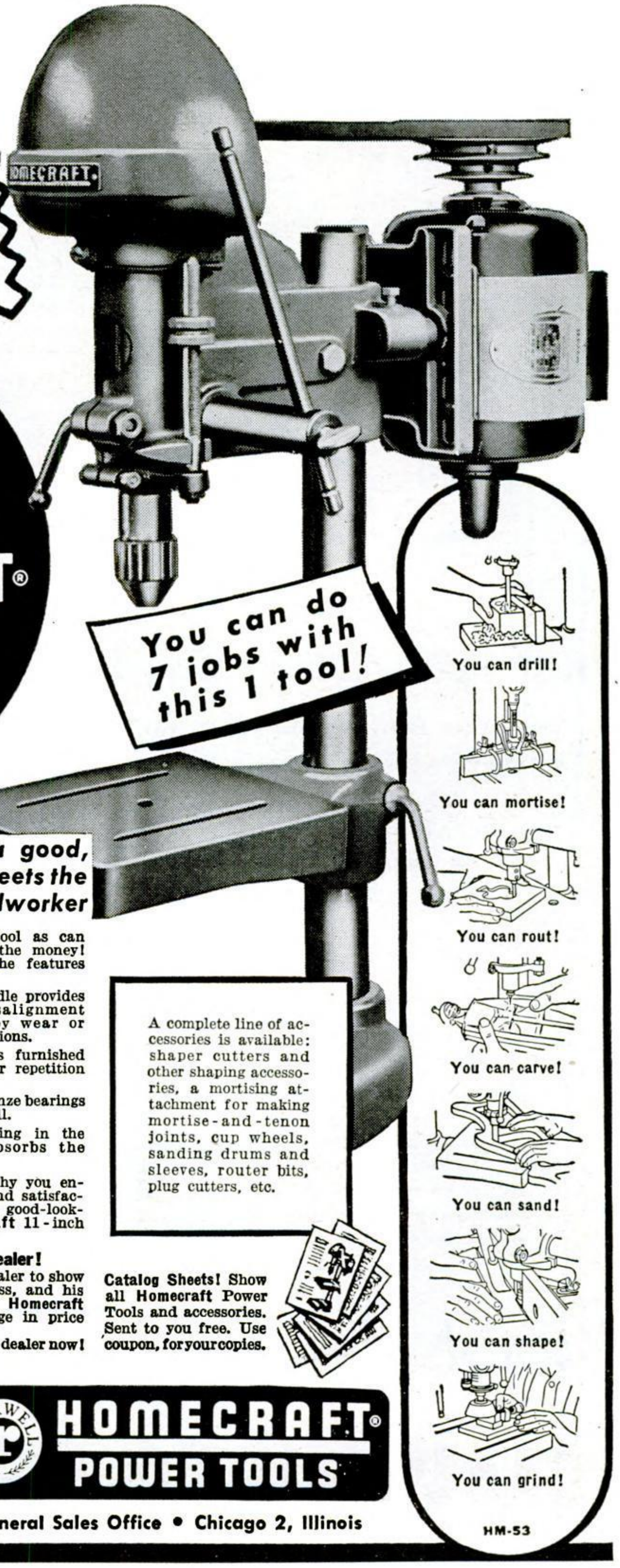
Copyrighted material

New!

A practical, economy-priced drill press built specifically for the hobbyist . . .

Only $39.95 for this HOMECRAFT® 11-inch Drill Press

(Motor extra)



Fulfills the long-standing need for a good, popular-priced tool that adequately meets the basic requirements of the home woodworker

You get a bigger kick out of "tinkering" with wood and light metal projects, when you have a **Homecraft** 11-inch Drill Press to help ease your work.

With this versatile tool, you do many jobs safely, accurately, and inexpensively. You can even drill ½-inch holes in cast iron. Four speeds provide a wide range from 700 r.p.m. to 4700 r.p.m.

Skillfully Designed and Built

Behind the **Homecraft** 11-inch Drill Press is the engineering "know-how" of Delta, the leading builder of home shop tools.

The accuracy, safety and dependability of Delta quality tools for home shops, schools, and industrial plants have led to their widespread use all over the country. Having a home shop equipped with Delta Power Tools some day is the dream of practically every craftsman who wants the very best!

A Real Value

In the moderate-priced **Homecraft** 11-inch Drill Press — intended solely for the hobby shop — Delta gives you as fine a tool as can possibly be built for the money!

Look at some of the features that are included:

- A free-floating spindle provides freedom from misalignment troubles caused by wear or other service conditions.
- The sturdy quill is furnished with a stop rod, for repetition depth drilling.
- Oil-impregnated bronze bearings are used in the quill.
- A ball-thrust bearing in the spindle pulley absorbs the thrust of the drill.

These are reasons why you enjoy a sense of pride and satisfaction working with your good-looking, efficient **Homecraft** 11-inch Drill Press.

See It At Your Dealer!

Ask your **Homecraft** dealer to show you this new drill press, and his complete display of **Homecraft** Power Tools that range in price from $29.95 to $39.95.

Visit your **Homecraft** dealer now!

A complete line of accessories is available: shaper cutters and other shaping accessories, a mortising attachment for making mortise-and-tenon joints, cup wheels, sanding drums and sleeves, router bits, plug cutters, etc.

Catalog Sheets! Show all **Homecraft** Power Tools and accessories. Sent to you free. Use coupon, for your copies.

Tear out coupon and mail today!

DELTA MANUFACTURING DIVISION
Rockwell Manufacturing Company
682M E. Vienna Ave., Milwaukee 1, Wis.

Please send free catalog sheets on **Homecraft** Power Tools.

Name_____

Address_____

City_____(__) State_____

ROCKWELL

HOMECRAFT® POWER TOOLS

General Sales Office • Chicago 2, Illinois

Copyrighted material

Simoniz Your New Car... From the Start!

Simoniz Keeps Colors from Fading ... Protects and Makes the Finish Last Longer

The sooner you SIMONIZ your new car the better! Your new car needs finish protection *now* . . . to "build up" the beauty . . . to give it brilliant beauty from first mile to last. SIMONIZ protects the finish from road grime and grit that scar . . . against corrosive airborne chemicals that dull and destroy. SIMONIZ saves car washings, too. Dust and dirt wipe off easily with a cloth. Remember, you can SIMONIZ your car only with genuine SIMONIZ and Simoniz Kleener. Insist on them always!

LIQUID SIMONIZ KLEENER is wonderful for cleaning quickly new cars or those with finishes in average condition. *Paste* Simoniz Kleener cleans, restores lustre and makes dull cars look new again. Then apply SIMONIZ to make that restored beauty last years longer.

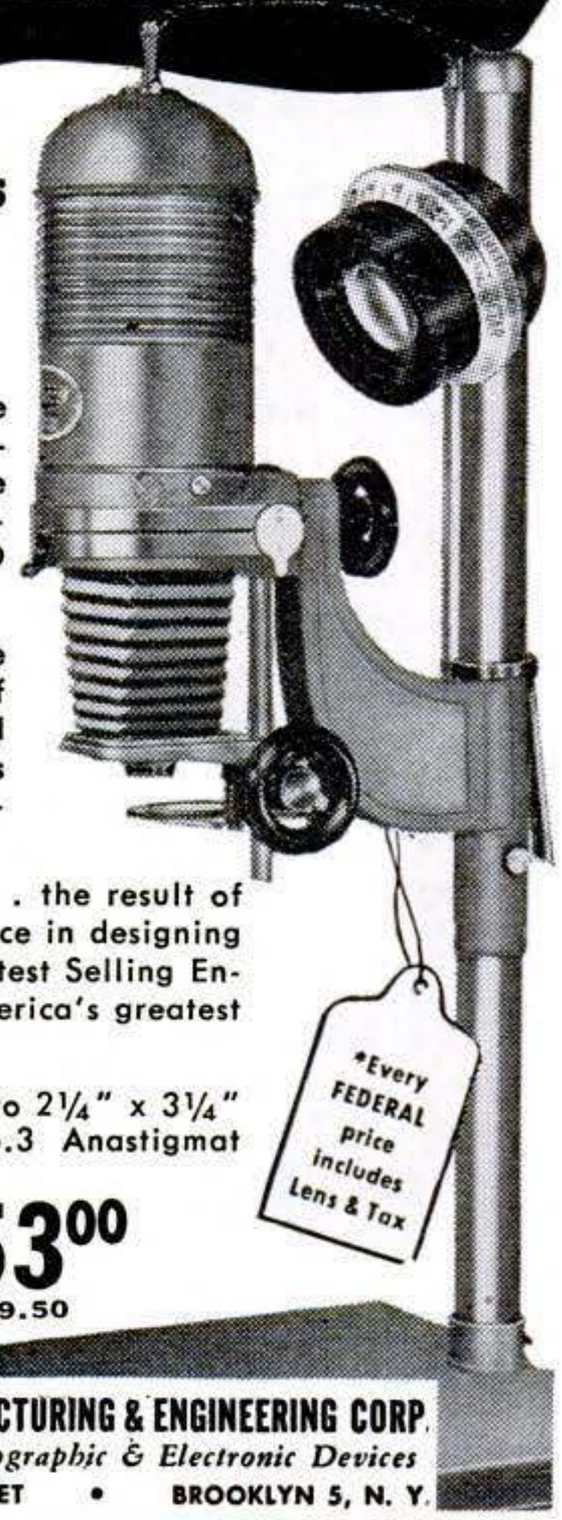
THE SIMONIZ COMPANY, CHICAGO 16, ILLINOIS

Motorists Wise SIMONIZ

TRADE MARK REG.

KEEPS NEW CARS . . . NEW LOOKING

Completely New and COMPLETE*



Federal's Low Price INCLUDES A Highly Corrected Enlarging Lens

When you examine the price tags of the new Federal Enlargers remember that the price on the tag is *for a complete enlarger . . . LENS AND TAX INCLUDED.*

For Federal's low prices are not arrived at by stripping off important enlarger parts and listing them as separate items in order to give the impression of low price.

Federal's prices are low! . . . the result of years of specialized experience in designing and building "America's Fastest Selling Enlargers" . . . undeniably America's greatest enlarger values.

MODEL 312. For miniature to 2¼" x 3¼" negatives. Fedar: 3½" F:6.3 Anastigmat with Iris Diaphragm.

Complete with lens Tax Included **$53.00**

Model 315 (as illustrated) $89.50

FEDERAL OF BROOKLYN

FEDERAL MANUFACTURING & ENGINEERING CORP.
Makers of Photographic & Electronic Devices
213 STEUBEN STREET • BROOKLYN 5, N. Y.

TOOL STEEL DRILL ROD

$3.50 POSTPAID in Continental U.S. C.O.D.'S ACCEPTED

9-18" Bars **SAMPLER KIT** 9 Sizes

1001 uses for Craftsmen, Hobbyists, Mechanics, Etc.

For Making
Punches
Chisels
Engraving Tools
Shafts, Etc.

Free machining, easily worked, yet can be made file hard. Hardening instructions included!

ORDER TODAY

FREE
With Every Kit or first order 6" Steel comb. rule & depth gage with pocket clip.

FLAT TOOL STEEL

The Precision ground flat tool steel with the satin-smooth finish. Simple to work, easy to harden, ready to use.

SHOP ASSORTMENT—$4.80
(5 dif. Pieces—1-32" to ⅛" thick; ½" wide; 18" long)
BOTH KITS—$7.95
Include 25c postage on orders under $5.00
We can supply ALL your Tool Steel Needs.

BESSEMER STEEL COMPANY OF AMERICA, Dept. CD-11
Small Shops Division, 1958 W. 59th Street — Chicago 36, Ill.

IF GLUE WILL FIX IT

FRANKLIN LIQUID HIDE GLUE

will do it better, faster, easier!

Ready-to-use Franklin makes joints stronger than the wood itself. Saves time — no mixing, no heating. Banish unpleasant odors, avoid chilled joints with Franklin Liquid Hide Glue.

The FRANKLIN GLUE CO., COLUMBUS 15, O

AT YOUR HARDWARE DEALER

Copyrighted material

SpeedWay

No. 117 PORTABLE BENCH GRINDER $14.95

A new type air cooled motor that has 3 times the power of the pre-war model. Protected self-aligning, oil impregnated bronze bearings. A new 1-piece die cast aluminum housing with integral wheel guards and tool rests. Built in switch, rubber covered cord and plug. 1 coarse wheel, 1 fine wheel (4½"x⅜"x⅜"). You can never appreciate the sweet running balance and grinding efficiency of this grinder until you test it. Ask your SpeedWay dealer to demonstrate.

"Blue Line" Tools

SpeedWay Blue Line Tools are built for use. Each operates at the correct speed for its capacity and operation: Grinders grind at the proper speed to give efficient f.p.m. without excessive wheel wear; drills drill at speeds that cut rapidly thru work but won't burn drill bits . . . or with one of the stands illustrated, quickly convert into a sturdy, inexpensive, lever-operated drill press.

Each has its own specially wound, high torque, long life, air cooled SpeedWay tool motor, and all embody the quality features and "tool sense" developed thru SpeedWay's 35 years of specialization in the design and manufacture of portable electric tools.

Standardize on SpeedWay Tools. You will not only have better tools but in each case more tool for the money.

Sold by hardware, farm implement tool dealers, and tool departments everywhere . . . by many household appliance outlets and electrical stores.

No. 129 GRINDER $8.25

No. 209 Drill Stand (Less Drill) $12.95

GA KIT $13.95

No. 89 ½" ELECTRIC DRILL $29.95

No. 229 DRILL STAND (Less Drill) $5.25

No. 69 ¼" DRILL $11.80

SPEEDWAY MFG. CO.
1864 South 52nd Avenue, Cicero, Ill.

Copyrighted material

YOU'LL NEVER KNOW HOW EASY METAL CAN BE CUT UNTIL YOU USE

ATKINS BLADES

Users everywhere—in homes, shops, plants—know that for cutting metal with speed and ease, you just can't beat Atkins Hacksaw Blades. They eat into metal with teeth that are designed right, set right, to take good deep bites. And they keep cutting for many more cuts between blade changes. "Silver Steel" puts an edge on teeth that really lasts. To get more pleasure from your work . . . to do better work . . . use Atkins "Silver Steel" Blades.

ATKINS TRADE MARK

E. C. ATKINS AND COMPANY
INDIANAPOLIS 9, INDIANA

No. LN 383 — 17 jewels, water-shock resistant, anti-magnetic, radium dial and hands. ALL STAINLESS STEEL CASE..... $55.00

OTHER SPORT WATCHES WATER-SHOCK RESISTANT

Precision tested, 17 jewels, anti-magnetic, radium dial and hands, unbreakable crystal, sweep second hand.
No. LN 197—Stainless Steel Back.....$29.75
No. LN 945—ALL STAINLESS STEEL CASE $37.50
Other fine watches from $12.65 Tax Incl.

ORDER BY MAIL: Send check, money order or pay C.O.D. THESE LOW PRICES INCLUDE FED. TAX & POSTAGE. Write for FREE Booklet "LN".

Repair Service — All types and makes of quality watches repaired expertly and promptly. Free estimate on request.

BELL WATCH COMPANY, INC.
Time and Life Bldg., Rockefeller Center, New York 20, N. Y.

NOW YOU TOO CAN BUILD 15 RADIOS

COMPLETE KIT $14.75

Absolutely no Knowledge of Radio Necessary
You Need NO Additional Parts

The PROGRESSIVE RADIO KIT is THE ONLY COMPLETE KIT. Contains everything you need. Instruction Book, Metal Chassis, Tubes, Condensers, Resistors and all Radio parts.

The 36-Page Book written by Expert Radio Instructors teaches you to build radios in a Professional Manner. You start with a 1-tube receiver. Before you are done with this kit, you will have built 11 Receivers, 1 Public Address System and 3 Transmitters.

SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit. PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your KIT NOW! ONLY..... $14.75

Postage prepaid with check or money order.
(Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. 90
22 Havemeyer Street Brooklyn 11, N. Y.

ELECTRICITY *Anywhere*

for HOMES FARMS SHOPS BOATS RADIO USE

● Onan gasoline-engine-driven Electric Plants supply reliable, economical electric service for any use Portable, stationary or stand-by models. Water or air-cooled, compact and rugged.

A.C.: 350 to 35,000 watts in all standard voltages and frequencies. D.C.: 600 to 10,000 watts, 115 and 230 volts. BATTERY CHARGERS: 500 to 3,500 watts; 6, 12, 24, 32 volts.

Write for folder

D. W. ONAN & SONS INC.
2777 Royalston Ave., Minneapolis 5, Minn.

Onan PRODUCTS

Copyrighted material

The BEST in SURPLUS

BRAND NEW
ARMY AIR FORCE

ASTROGRAPHS

ORIGINAL COST $125. *Only* **$3.95**

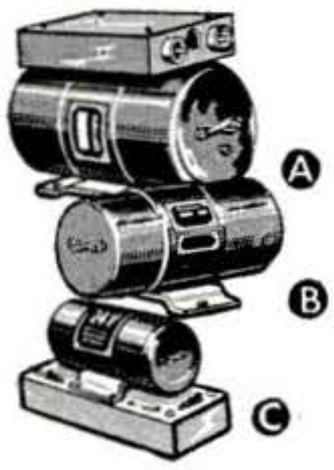
Thousands of uses. An ideal navigation instrument for boats, yachts, etc. A wonderful unit for home construction of contact printers, enlarger, strip map holder, etc. A beautiful precision instrument consisting of machined aluminum housing with optical glass view plate, two large ratchet film drive knobs and shafts, one film spool, variable light source slide and holder, illumination control rheostat, resistor, power plug and tools. All housed in beautiful plywood case measuring 14½x11x10" high. Case has leather handle, steel reinforced corners, hinged lid with stop, lower compartment divided into eight sections. Case is ideal for fishing kit, picnic set case, tool kit, portable radio case, make-up kit, travel case. Case alone worth twice the giveaway price we are asking for both. Shipping weight, 20 lbs.

BC223 TRANSMITTER

One of the Army's best. Ideal for amateur use, covers 80 meter band, 25. watt, crystal controlled, supplied brand new with meters, tuning unit, speech amplifier, and modulator. Less tlbes. Shipping weight, 80 lbs.

$12.95

DYNAMOTORS



Consists of electric motor operating generator on same shaft. Many applications — operating radios from storage battery — using as motor.

Dynamotor A—Input 12 volts, output 1000 volts at 350 MA, Shipping weight, 72 lbs. .. **$7.95**

Dynamotor B—Input 6 or 12 volts, output 350 volts, 160 MA. Shipping weight, 30 lbs. ... **$5.95**

Dynamotor C—Input 28 volts, output 220 volts at 60 MA. Shipping weight, 6 lbs. **$1.50**

GENERATOR

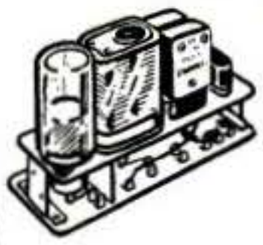
Makes an excellent home lighting plant and can be operated by wind propeller, waterfall, gas engine, or hand crank. Reduction gear allows full output at very slow speed; supplies 6 volts at 2.45 amp., 425 volts at .115 amp. Brand new, GN-58. Ship. wht., 28 lbs. **$7.95**

INTERPHONE AMPLIFIER

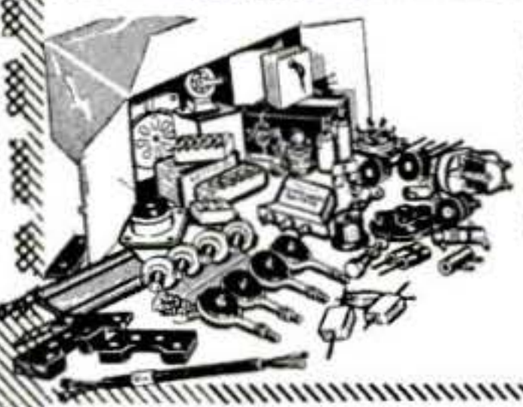
The famous tank communication set. Makes excellent communicating system, public address system, phonograph amplifier. Comes complete with two tubes, volume control, pilot light, has circuit diagram. These units are in used condition as removed from tanks. Shipping weight, 31 lbs. **$2.95**

TUNING UNIT

The heart of the Army Walkie-Talkie. Contains transmitter crystal and tank coil, receiver coil, tuning condenser and crystal; ideal foundation for small set. Shipping weight, 1 lb. **$1.00**



ELECTRONIC KIT



Experimenter's paradise. Five lbs. of new condensers, transformers, coils, switches, sockets, resistors, selenium rectifier, earphones, etc. Parts for dozens of experiments. Shipping weight, 6 lbs. **$1.00**

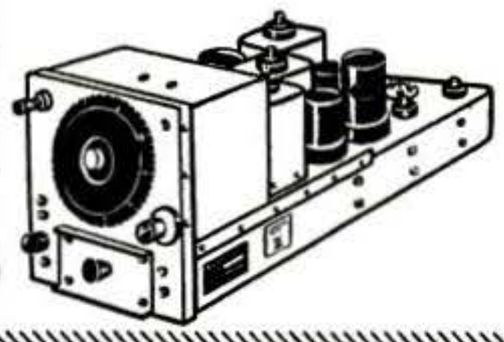
MINIATURE HEADPHONES

Miniature type headphones. Ideal for hearing aids, listening to radio in bed, etc. Complete with headband, cord and two sets rubber ear plugs. Shipping weight, 1½ lbs.

ONLY **$1.00**

BC455B AIRCRAFT RECEIVER

Brand new 6-tube superheterodyne aircraft radios, 3-gang cond., RF stage, 2 IF stages, tunes 6 to 9.1 Mc; built by West. Electric. Complete with tubes in original carton. Easily converted. Shipping weight, 8 lbs. **$4.95**



PUSH BUTTON TUNER

This beautifully constructed unit was used on an Army FM receiver. A ten push-button assembly operating four gang silver plated tuning condenser drum dial manual tuning. Brand new. Shipping weight, 10 lbs. **$2.50**

THROAT MICROPHONE

Brand new Army T-30 throat microphones. Used in aircraft, tanks, etc. Broadcast through your radio, use in noisy factories, for home telephone systems, hundreds of applications. Shipping weight, 1 lb. **$1.00**

Include POSTAGE FOR WEIGHT SHOWN

The HEATH COMPANY
DEPT. S . . BENTON HARBOR, MICH.

Copyrighted material

NOW
A motor with the name you know

The New HOOVER Fractional Horsepower Motors

¼ horsepower and up

You know what you are buying when you see "Hoover" on the name plates of these new fractional horsepower motors.

You know Hoover is the "great name" in electric cleaners; you know its reputation for fine products.

FEATURES OF THE HOOVER MOTOR

Induction run . . . single phase . . . 60 cycles . . . 1725 R.P.M. . . heavy duty . . . built for continuous operation.

Capacitor start . . . more than 300% full load starting torque with minimum current flow.

No vibration or "shift" . . . integral feet, carefully machined to give solid mounting and quiet operation.

Low temperature . . . electrical and mechanical design for low-temperature operation. Ventilated open type. 40° C. Rise.

Laminated steel rotor . . . carefully ground and balanced for maximum efficiency.

Centrifugal starting switch . . . built for years of trouble-free operation.

High-grade ball bearings . . . sealed against dust and grit, give smooth performance and long wear.

Rotation . . . clock or counterclockwise.

POPULAR USES OF HOOVER MOTORS

Lathes

Hand drills

Drill presses

Sanders

Jig saws

Hand saws

Bench saws

Grinders

Hobby shops

Garage tools

Makers of the World-Famous **HOOVER CLEANERS**

See your authorized Hoover motor dealer. If unable to locate, write:

THE HOOVER COMPANY
Electric Motor Division
North Canton, Ohio; Hamilton, Ontario, Canada

25-Year Club—

. . . folks who have been doing a good job for a long time! And Inkograph's right up among 'em! Been working for 33 years, is hard to wear out! Inkograph's point is like a pencil's —one-piece, rounded, cylindrical, made of extra hard 14kt. gold—can't bend or spread. Writes easily on any kind of paper. Fits any hand or writing style. Makes carbon copies, rules lines. In five smart colors, and black. At all good stores And . . .

only $2

INKOGRAPH

Inkograph Co., Inc., 200 Hudson St., New York City 13, N. Y.

SAVE MONEY

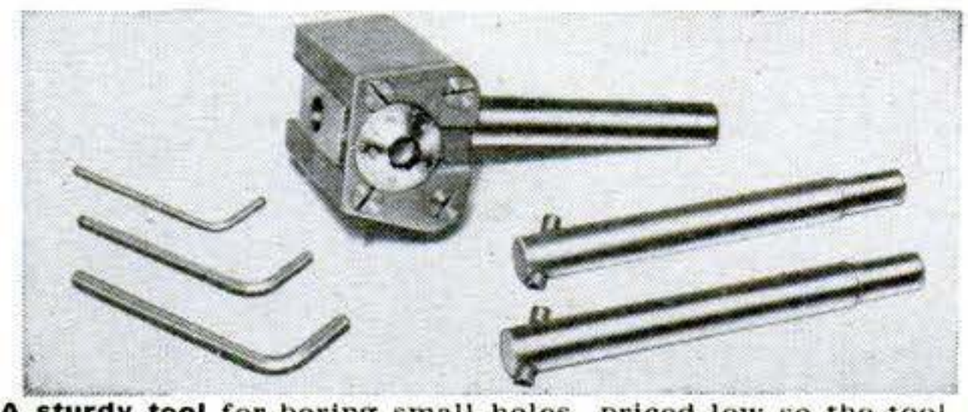
build your own

SMITH COMPRESSOR

Now, use the world-famous Smith Air Compressor to operate rock drills, paving breakers, spray guns, sandblasting, etc., at low cost! Just order the Smith Compressor Head and Accessories with complete instructions for assembling. All you need is a Ford Motor and shop facilities. Capacity 60 cu. ft.—ample power for most compressor jobs. Pressure up to 100 lbs. per square inch. Head equipped with high speed compressor valves; automatic unloading and idling.

WRITE TODAY! **GORDON SMITH & CO., Inc.** 405 College Street Bowling Green, Ky.

LOW COST MICROMETER BORING HEAD



A sturdy tool for boring small holes, priced low so the toolmaker may have one in his own kit. Originally designed for the bench mill, this tool may also be used on large machinery where small holes are to be bored. Head is 2⅛" x 1¾", fitted with a No. 2 Morse tapered shank, tapped ⅜" for a tie rod. Can be furnished with a ½" straight shank. Dial is graduated in .001. Screw has ⅜" travel. Complete with two boring bars (7/16 x 3½ and 5/16 x 2½), tool bits and wrenches. Price **$17.50** postpaid.

STATE TYPE SHANK WANTED

Frank Tyson, Inc. 211 7th STREET SE. CANTON 2, OHIO

Copyrighted material

It's an Evinrude "plus"

for your greater boating enjoyment

EVINRUDE NATION-WIDE *Service*

With an Evinrude, you enjoy trouble-free performance that's known and respected everywhere.

But run any motor long enough and hard enough and *you'll want service*...and no nonsense about it!

When that time comes, it's mighty satisfying to own an *Evinrude.*

Because, in just about every boating center and popular fishing spot in America, *Evinrude Service* is close at hand... where you want it when you need it!

Friendly, capable, it is ready to help you — on a quick trouble-shooting job, a major repair or a complete overhaul.

Evinrude service mechanics are experts; many are factory trained. Factory parts are used, precision made and *right!* Every step is an efficient, proved factory procedure.

Own a motor that "stays young"! With an Evinrude you can *keep on running* your motor as many years as you like.

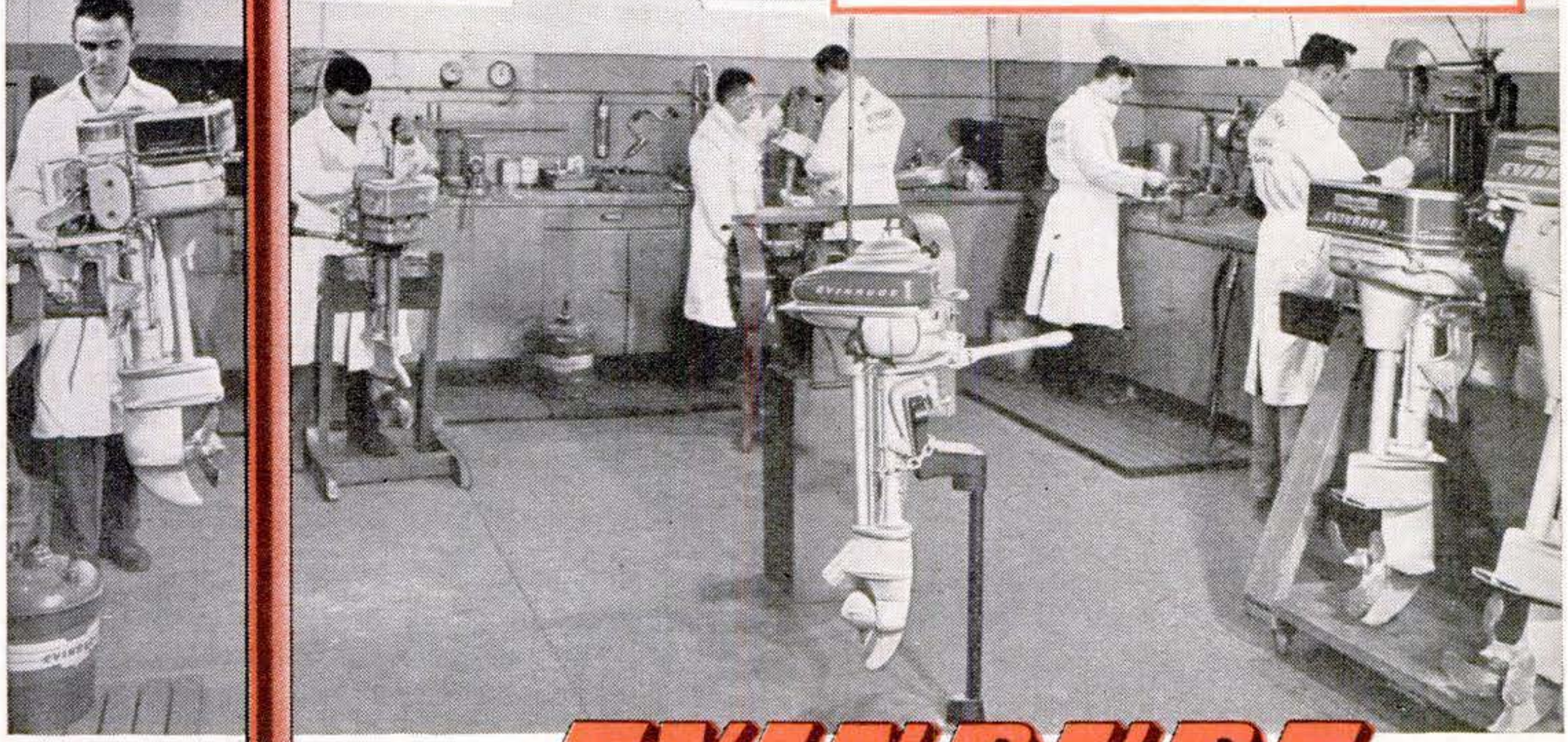
You can bank on Evinrude Service to maintain "performance like new" in your motor's 5th year — or its 10th — and for years after.

Higher resale value, too! Used Evinrudes are always in demand, bring favorable trade-in allowance, sell at good prices. Buyers know that their investment in an Evinrude is protected by this *established, continuing, nation-wide service.*

If you own an outboard motor (any make) you can benefit by Evinrude Service right now. Take your motor to an Evinrude Service Dealer for seasonal check up, needed repairs, safe winter storage. If you have considered trading in your old motor on a sparkling new Evinrude, *this is the most favorable time,* with assurance of early delivery. Look for your dealer's name in your classified phone directory. For complete catalog, write EVINRUDE MOTORS, 5632 N. 27th Street, Milwaukee 9, Wis.

In Canada: Evinrude Motors, Peterboro, Ontario.

Evinrude and Evinrude dealers have been perfecting Evinrude Service since the earliest years of the industry. Many Evinrude service departments were established 20 and 30 years ago. The service department pictured here has been delivering satisfying service to Evinrude owners for 36 years.



EVINRUDE

FIRST IN OUTBOARDS • 38TH YEAR

Copyrighted material

Discovered!

What makes a shooter Merry on Christmas (and all year)? The Mossberg, 20-power "SPOTSHOT"

Just about as nice a gift as a fellow could receive—*or even give to himself!* **Used and recommended by experts; it does everything you require of a fine spotting scope on the rifle range. Also excellent for general long-range observation.**

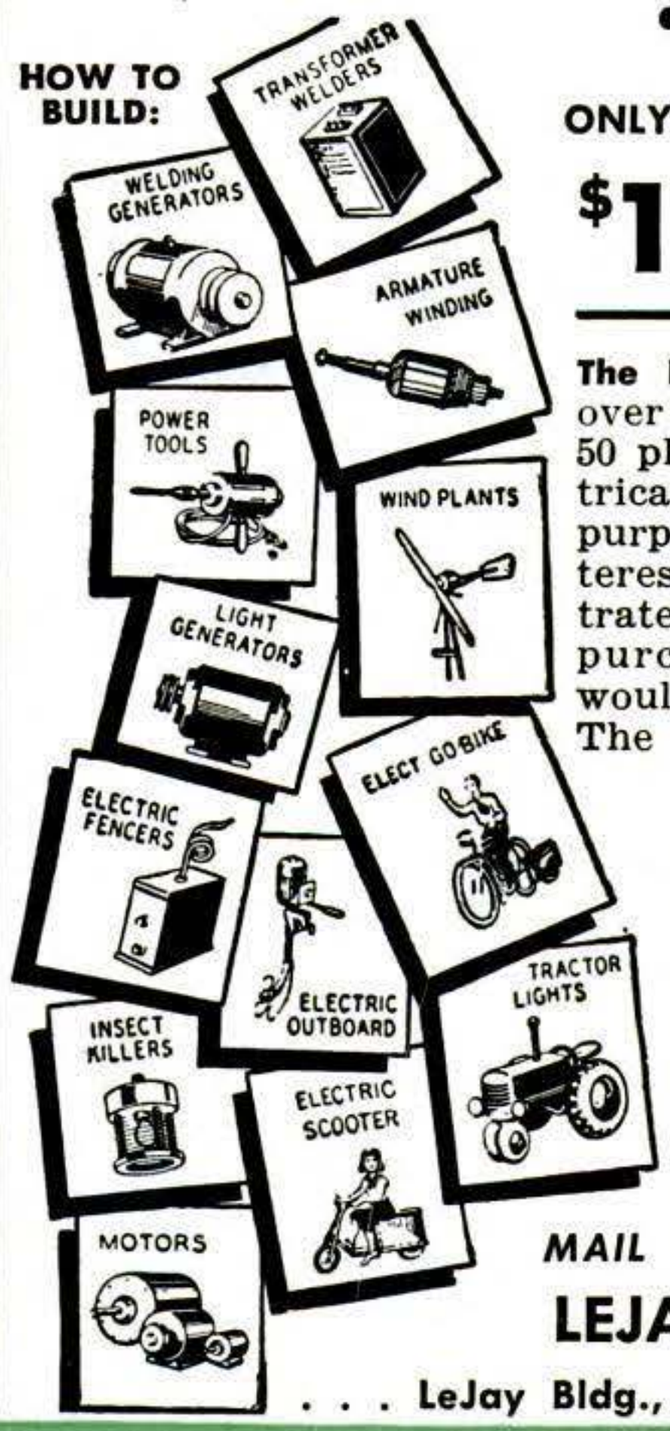
SEE IT AT YOUR DEALER'S

Catalog on request **No sales at factory**

O.F. Mossberg & SONS, INC.
NEW HAVEN 5, CONN.

79711 St. John Street, New Haven 5, Conn.

A GIFT HE'LL SURELY APPRECIATE!



ONLY **$1.50** *IN XMAS WRAPPING*

The LeJay Manual contains over 100 items, embodied in 50 plans, for making electrical equipment for many purposes. A few of the interesting projects are illustrated here. These plans purchased individually would cost $12.35.

The plans are easy to follow, and do not call for expensive equipment. The tools he has around the house are all he'll need, and much of the necessary material can be found in workshops, garages and scrap yards. A handsome catalog is enclosed with this gift.

MAIL THAT $1.50 EARLY!

LEJAY MFG. CO.

. . . LeJay Bldg., Minneapolis 8, Minn.

Christmas

A perfect present!
Give one of these CONSTRUCTION SETS MADE OF STEEL!

Build Trains, Bridges, Machinery Models, Toys

A CONSTRUCT-O-CRAFT is fun, fascinating, and educational. Comes in 3 sizes—each one beautifully boxed, complete with a big, handsomely illustrated Handbook showing how to assemble 70 models. Truly a bargain "buy"—and sure to please!

OIL TRUCK
1/7 ACTUAL SIZE

MODEL 550
3⅛"x2⅜"

A REAL 110 VOLT—AC MOTOR!
Cased in aluminum...ready to plug into electrical outlet...GUARANTEED FOR 1 YEAR—**$5.95 complete**

_____ #800 @ $12.95 — 390 PARTS (WITH MICRO MOTOR)
_____ #500 @ $6.95 — 350 PARTS
_____ #300 @ $3.95 — 196 PARTS
_____ MICRO MOTOR #550 @ $5.95
ALL POSTPAID

PARK SALES DISTRIBUTING CO.
9604 S. Millard Ave., Chicago 42, Ill.
Please send me the Models checked at left.
$_____ inclosed (money order or check)
NAME_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

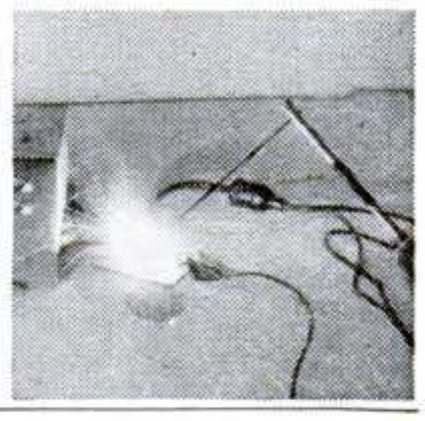
SENSATIONALLY PRICED

ELECTRIC TORCH

Now only
$12
FULLY GUARANTEED

WELDS • BRAZES • CUTS • SOLDERS

Just plug into nearest socket. Arc furnishes up to 10,000 degrees Fahrenheit. Welds metal up to 3/16" thickness, uses up to 3/32" rod. Cuts all steel including hard tungsten. Complete equipment includes unit plus carbon tipped dual copper electrode Cutting Torch and single electrode Welding Torch with attached alligator clip. Generous supply of welding materials. One welding job may more than pay cost of entire unit. Ideal for home workshop. Invaluable for body and fender shops, garages, repair and machine shops, etc. C.O.D. $12 plus postage (wt. 4 lbs.) or send $12 and we pay postage. Money back guarantee. Free Folder on request.



CALIFORNIA TECHNICAL PRODUCTS CO.
8510 WARNER DRIVE • CULVER CITY, CALIF.
DEPT. B-11

PRESENTING THE *NEW*
Dual Caliber
Super Power

APACHE AIR RIFLE

BIG .250 CAL.

ACTUAL SIZE

Here's the BIG .250 Cal. air rifle you've waited for. Shoots .250 or .175 Cal. in separate barrels with smashing accuracy. All steel and brass. Rifled barrel, safety, adjustable sights. Apache .250 Ball Shot available. At your dealers or SEND FOR FREE BOOKLET.

NATIONAL CART CORPORATION
234 East Colorado • Pasadena 1, California

AN IDEAL AND PRACTICAL GIFT FOR ANY MAN

Now a DYNAMIC Industrial Transformer Type Super Charged WELDER

FOR ONLY **$28.50** COMPLETE

For AUTO, HOME APPLIANCE and FARM REPAIRS!

DESIGNED TO DO HIGH GRADE WELDING INEXPENSIVELY—Maintenance Men, Farmers, Mechanics, Machine Shops, Foundries, Auto, General Repair and Job Welding Shops, all using the DYNAMIC find it so indispensable and useful that they can't afford to be without it. **EASY-TO-OPERATE.** If inexperienced you can easily learn to do a variety of high grade welding jobs by following the practical, *simplified* WELDING and OPERATING INSTRUCTIONS FURNISHED. Once you see the DYNAMIC in operation you won't want to be without it. Its simplicity will amaze you. In a year the DYNAMIC only costs you about 7c a day. Comes complete ready to operate with helmet, rods, cable, holder, operating and welding instructions, etc.

Do Your Own Welding Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop . . . Make money doing repair work for others.

Write Today for Particulars

GET DETAILS on our 10 day **Trial Offer.** Member Chicago Association of Commerce.

SAVES YOU VALUABLE TIME AND MONEY

This portable, industrial transformer type DYNAMIC WELDER easily carried right to the job can be operated from any convenient properly wired 110 Volt 60 Cycle Line.

WORKS ON IRON, STEEL, BRASS, BRONZE AND OTHER METALS

Has 8 metallic and carbon arc heat stages. Does work you would think only possible with a larger more expensive machine . . . CAN ALSO BE SUPPLIED FOR 220 VOLT 60 CYCLE OPERATION and other voltages and cycles at slight additional cost.

DYNAMIC WELDER CO., 13 East 23rd Street, SP, Chicago 16, Ill.

MAIL COUPON FOR FREE DETAILS

10-DAY TRIAL OFFER

DYNAMIC WELDER CO.
13 EAST 23rd STREET, SP, CHICAGO 16, ILL.
Send me free details of your 10-DAY TRIAL OFFER.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Gift Mart

New PERSONAL RADIO

Pocket Size

This little radio is substantially built and is so constructed that, if dropped, it will not break. It has a beautiful red leatherette case. May be carried in your pocket wherever you go. *Reception is guaranteed* when used according to instructions.

There is no cost in operating this radio as there are no tubes and no batteries to buy, and no electricity needed. Instead, the new "Crystal diode" rectifier same as used in Army and Navy ultra hi-frequency radar sets is being employed. It is not a toy, but a practical little radio for football or baseball games, news reports, or your favorite program. It is especially good to listen to in bed, or in hospitals, dormitories, barracks, and offices because it is not heard by anyone but yourself.

Send only **$1.00** (check, money order, cash) and pay postman **$3.95** plus delivery fees, or send **$4.95** for postpaid delivery.

SHEESS MFG. CO., LAKE GENEVA, WIS.

A PROFESSIONAL ENLARGER AT ½ USUAL PRICE!

THE MINILITE ENLARGER

Diffusion type system with hand ground discs

Fully guaranteed Professional Enlarger. Body of aluminum alloy castings. Includes rotating glassless negative carrier to enlarge up to 2¼x3¼" neg. Tilts from vertical to full horizontal. Rack-and-pinion focusing with extra large knobs. PRICE, less bulb and lens only $29.95 plus $3.75 tax. Now selling for less than ½ regular price by assembling yourself (all you need is a screwdriver). Simple step-by-step instructions and diagrams. Use your camera lens or f4.5 or f6.3 lens—mount on workshop bench or own baseboard. SEND NO MONEY—Pay postman $33.70 plus postage (weight 6 lbs.) or send money order and we pay postage. Free Folder on request.

FULLY GUARANTEED ONLY **$29.95**

CALIFORNIA TECHNICAL PRODUCTS CO.
8510 WARNER DRIVE • DEPT. C-11 CULVER CITY, CALIF.

YOU ASSEMBLE • SAVE $30

IT'S HERE!
The Greatest Pipe In Smoking History!
Makes All Others Obsolete

THE REVOLUTIONARY **REGAL** PIPE N'LIGHTER

Ideal For
HUNTERS, FISHERMEN OUTDOORSMEN

Self-Lighting
Self-Cooling
Self-Cleaning
Finest Imported Briar

Never gets hot . . . never gets strong! . . . A flick of the thumb and it's lighted . . . A twist of the wrist, a pull—and it's clean!

Try A Regal For The Coolest, Cleanest, Sweetest Smoke You've Ever Had!

With Lighter-$10.00 Postpaid.
Without Lighter-$7.50 Postpaid.

Mail Coupon Today For "The Pipe That All America's Talking About".

Thomas Pipe Shops PS-1 Free gift box
300 S. Los Angeles St. with every pipe
Please send me_____Regal Pipe N'Lighter @ $10.00
Please send me _____Regal Executive @ $7.50
I enclose $_____
Name_____
Address_____

Copyrighted Material

USE AC's FOR

UTMOST RELIABILITY

"The mail must go through"—and does, with the help of today's AC's in thousands of mail cars and trucks. You can enjoy utmost reliability in spark plug performance by having your spark plugs checked to be sure they are right for today's driving and fuels.

Look for this sign

Authorized AC SPARK PLUG CLEANING STATION

Spark Plugs cleaned and adjusted "By the AC Method" may save as much gas as 1 gallon in 10

AC SPARK PLUGS

AC SPARK PLUG DIVISION - GENERAL MOTORS CORPORATION

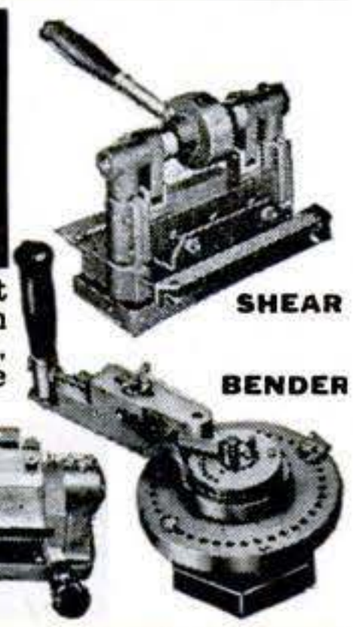
ONLY $26.95 LESS MOTOR

Favorite of home owners and craftsmen for 20 years! SPEEDY SPRAYER gives your work that professional paint finish everyone admires. Sprays paint, enamel, varnish, lacquer, etc. . . . 4 to 7 times faster than hand brushing! Lightweight, portable, uses any ¼ H.P. motor. Improved diaphragm principle assures clean, oil-free air. You'll find dozens of time and money saving uses for SPEEDY SPRAYER, including spraying insecticides 2-4-D and DDT. Complete outfit, without motor, only $26.95.

At leading hardware, lumber, and auto supply dealers.
FREE—*write for handy booklet "How to Spray."*

W. R. BROWN CORPORATION
5718 Armitage Ave. • Chicago 39, Ill.

DIE-LESS DUPLICATING



Many small parts can be formed without dies, to duplicated accuracy of .001" with DI-ACRO Precision Machines, — Benders, Brakes, Shears. Save die expense and time delay. Ideal for experimental and research work, making samples, models, etc. as well as regular production runs.
Write for descriptive literature.

O'NEIL-IRWIN MFG. COMPANY
342 8th Ave., Lake City, Minn.

Arc Welded Design "Know-How"

Only $3.50 each
3 different volumes
$10.00 postpaid

Each volume contains over 100 welding designs. Write
Hobart Bros. Co. Box P-561, Troy, O.

PRESS-TITE CAULKING AND SEALING CORDS

Keep cold out! Seal holes and cracks!

Soft, rope-like Press-Tite Cords effectively seal windows and doors against cold and dust. Save fuel.

Press-Tite Cords will not harden—they stay soft and seal tight. Use also to fill any cracks or holes in wood, plaster, masonry or brick. Just press into place —no tools needed.

PRESSTITE ENGINEERING CO.
3976 Chouteau Ave., St. Louis 10, Mo.

Copyrighted material

$29.95
POST PAID

The UNI-VISE
Saves Time - Money ●

No limit to the usefulness of this handy universal angle swivel vise. Replaces costly jigs on milling machine, drill press, shaper or grinder. Ideal for home workshop or machine shop. Hardened steel jaws, 3" x 1¼". Open to 2¼". Practical all-purpose tool. Easy to operate. Weight 13½ lbs. . . .

From your dealer or send direct!

UNION TOOL CORP.

370 E. MARKET ST. • WARSAW, IND.

Heavy Duty - Ball Bearing - All Purpose

MANDREL

Length Overall 14"
Diameter OD 1¾"
Shaft ½" or ⅝" Optional
Lugs ¼" x 1¼" x 3⅜"
2" between collars
Right or left hand
Thread Optional

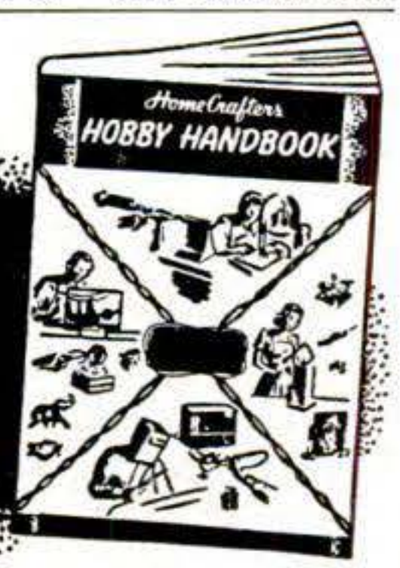
Postpaid $8.00 in U. S.

Precision ground ball-bearings; Bessemer steel shaft, completely enclosed; seamless steel body. For home, farm and shop—saws, shapers, fans, power take-off, wind mills, etc. Be sure to state shaft size and thread (R or L) desired. Send Money Order or Certified Check. Full money back guarantee. If your dealer cannot supply you, write.

TRIO MACHINE CO. Box 187 Dept. PS Willoughby, Ohio

NEW!

HOBBY HANDBOOK



A GOLD MINE of INFORMATION on NEWEST EQUIPMENT, TOOLS for HOME CRAFTSMEN & MECHANICS

If you work in metals, wood, plastics or glass you need this Giant NEW Book of equipment, tools, parts and materials . . . including dozens of hard-to-get items you can't find in stores. Many things you must have for your home hobby or shop.

HELPS YOU GET MORE PLEASURE, MORE PROFIT in
- HOME CRAFTS
- METAL CRAFTS
- WOODWORKING
- PLASTIC CRAFTS
- HOME REPAIRS

A WAREHOUSE OF THINGS YOU NEED AND WANT

Over 100 items including Spray Guns; Power Bench Tools; Lathe; Drill Press; Drills; Grinders; Tank and Brush Electroplaters; Telephone System; Tool Chest; Model Tools; "Pin Money" Makers for your sparetime fun and profit! **SEND NAME and ADDRESS and 10c TODAY! Price of Handbook refunded on first order.**

WARNER ELECTRIC CO., Dept. P-29
1512 JARVIS AVENUE, CHICAGO 26, ILLINOIS

How modern science can help you *Hear Better!*

EXPLAINED IN *FREE BOOKLET*

Every hard-of-hearing person will be interested in up-to-the-minute, authentic information on scientific correction of hearing loss. Western Electric offers a new illustrated booklet, "Modern Science and Your Hearing." We'll also send a free booklet on two new *all-in-one* Western Electric Hearing Aids: New Super 66—tremendous power, superb fidelity, outstanding performance; and popular Model 65—compact, economical—smallest hearing aid ever built by Western Electric.

MAIL THIS COUPON NOW!

Western Electric **Dept. 380-PS11**
195 Broadway, New York 7, N. Y.

Please send my free copy of "Modern Science and Your Hearing." Include the illustrated booklet on two new *all-in-one* Western Electric Hearing Aids.

Name_____

Address_____

City_____ Zone_____ State_____

Distributed in Canada through Northern Electric Co., Ltd.

Copyrighted material

THE BEST GIFTS FOR XMAS ..or any time!

UNIVERSAL LATHE

The finest small bench grinder made. 115 volts, 25 to 60 cycles, AC-DC, 1/20 HP, 5000 RPM. Complete with arbor and 3/32" chuck. Takes all standard tools. 2" stone. Weight 6 lbs. Shipped Prepaid. With variable speed $22.95. **$18.95**

$1.95 TOOL SET INCL. FREE

115 VOLT MOTOR

A 1/20 HP AC-DC 115-Volt motor, 25 to 60 cycles, 5000 RPM, double shaft. Can be used with rheostat for sewing machines; also as a hand grinder, and a 101 different uses. Motor, **$9.00** Rheostat, $5.00; chuck or arbor to fit motor, $1.25 each. Shipped prepaid.

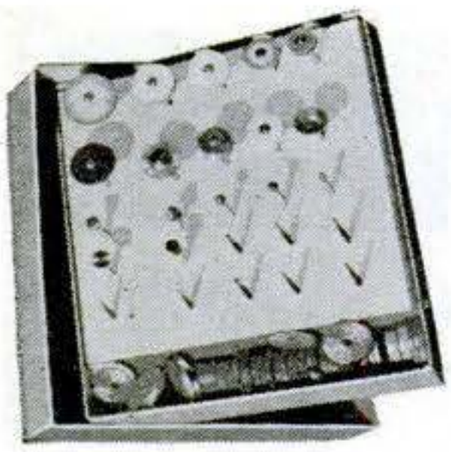
SPECIAL DELUXE SET

25 Assorted Cutters, Saws, Reamers, Borers

If you can duplicate this wonder value in any hobby shop at less than $15.00, return your set and get your money back. This is the greatest value we have ever offered —25 assorted hardened steel cutters for working on plastics, metals and wood. Assorted shanks 3/32, 7/64 and 1/8" diameters. Shipped prepaid. **$5.95**

MASTER ARBOR SET

Combination of 3/32" and 1/8" shafts. Very large assortment of wanted pieces includes: brushes, stones, felts, mandrels, grinding wheels, rubber polishers, sanders, 15 burrs, cutoff discs, polishing rouge, etc. Money back if you are not satisfied value is $15.00 or more. Shipped prepaid. **$6.95**



DE LUXE ARBOR SET

Includes 140-piece assortment of engraving and carving burrs, grindstones, cutoff wheels, polishing buffs, bristle polishing brushes, mandrel arbors, garnet and emery sanding discs, many with remountable shafts—really a $10.00 value. Send check, Money Order or Cash. Shipped prepaid. **$4.95**

60 PIECE ARBOR SET

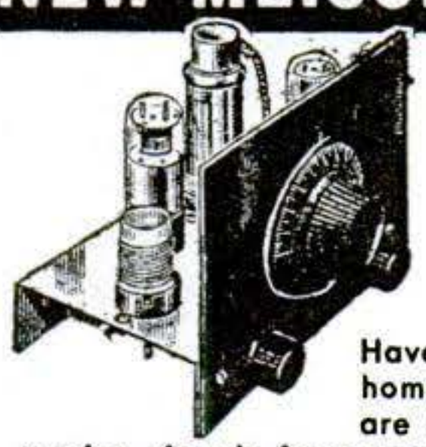
Contains all of the above, but in smaller quantities. If items bought singly value is $4.00. Our price shipped prepaid, only **$1.95**

ALL C.O.D. ITEMS $1.00 DEPOSIT

All above items are carried in stock at all times.

GENERAL AIRE CO
447 W. Norris St. • Phila. 22, Pa.

Special! BUILD YOUR OWN "Personal Radio"
NEW MEISSNER RADIO KITS



2-TUBE AC-DC Model... $5.65

3-TUBE AC-DC Model... $6.30

Have your own "Personal Radio" at home. These fine new Meissner kits are not toys, but real radio sets that receive signals from great distances. Supplied with plug-in coils for broadcast bands. Two controls. Pictorial diagram makes assembly very simple with screwdriver, pliers and soldering iron. All parts and material supplied, except tubes, phones, aerial. For 110 volts AC or DC. 5 lbs. No. A-10998 2-Tube, No. A-10999 3-Tube Kit.

Kit of 2-Type 76 Tubes for above.....$1.48
Kit of 3-Type 76 Tubes.....$2.22
Set of Head Phones.....$1.95

T-17B MICROPHONE

All Brand New — Perfect Carbon Hand Mikes. Light Weight, 200 ohms. Single button, press-to-talk switch. 5 ft rubber cord, plug, dust cover. Terrific at **99¢**

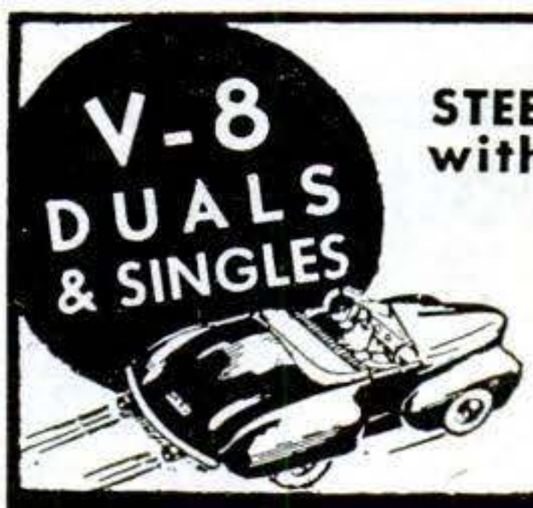
F.O.B. N Y. or Chicago • Send for Bargain Bulletins

NEW YORK
Offices & Warehouse
242 W 55th St, N Y 19

NEWARK ELECTRIC COMPANY, INC.

CHICAGO
323 W Madison St
Chicago 6, Ill

New York City Stores. 115-17 W. 45th St & 212 Fulton St



MUFFLERS
STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev, V-8, Plymouth, Steels $5.50, Aluminum $6.50. Chry., Olds., Buicks, etc., Steels $7.50, Aluminum $8.50. V-8 and MERCURY DUALS, Steel $17.50, Aluminum $20.00. Aluminums are guaranteed for life of your car.

DEALERS WANTED

SANDEE MUFFLER CO.
7523 S. WESTERN AVE., LOS ANGELES 44, CALIF.

PAINTERS' STRIPING TOOL

NOW! PAINT STRIPING MADE EASY!

Easy to use as a pencil! Draws parallel lines, straights, curves, circles with paint, enamel, lacquer, etc. Do your own striping on autos, furniture, toys, bikes, model planes, signs, linoleum . . . make wall board look like tile. Painters—craftsmen, order today! Type "M" Master Painters' Striping Tool complete with tip for 1/16" stripe, $1.00. Extra tips 1/64", 1/32", 3/64", 1/16", 5/64", 3/32", 1/8"—75c each. Tool with complete set of 7 tips $5.00 (C.O.D. orders 25c extra.) Dealers write!

WENDELL MFG. CO.
4234-A Lincoln Ave., Chicago 18, Illinois

Copyrighted material

PALMGREN

No. 000 ANGLE VISE

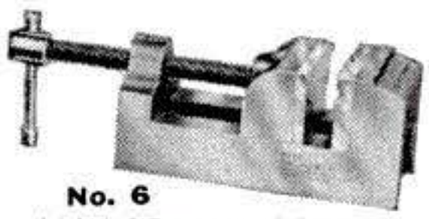
For MILLING—DRILLING—GRINDING FITTING—FILING

Solve Difficult Angle Jobs

Quick, accurate set-ups at any angle. End make-shift methods —time loss—rejections. Ideal for tool rooms or home workshop. Accurately machined and graduated. Once set it stays locked. Jaws of steel—plain or grooved. PRICE $11.25 complete with Swivel Base. Write for other styles and sizes.

DRILL PRESS VISES

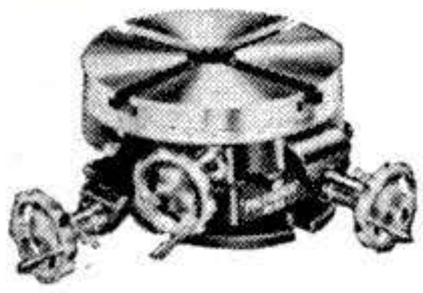
For tool room, machine shop, school shop, home shop or repair shop. Accurately machined. Best semi-steel castings. Adjusting screw of hardened steel with fine pitch thread and long bearing. Jaws of steel, grooved or plain. Sizes 1½" — 2½" — 4" Jaws.



No. 6
1½"-GROOVED STEEL JAW. $4.

No. 83 ROTARY TABLE with . . .

DUAL CROSS FEED and ROTARY FEED

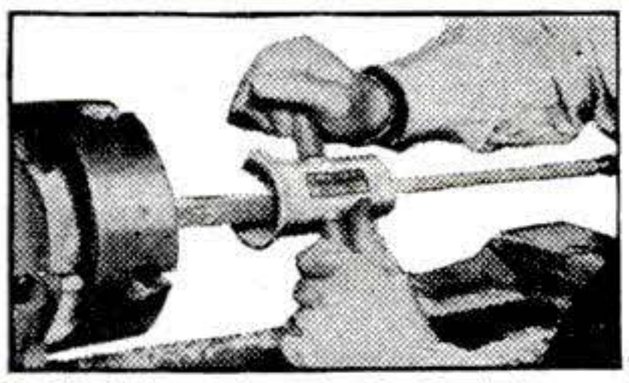


Has 8" Circular Table with full 360° movement and 4" crossfeed travel. Free moving adjusting wheels and dials graduated in degrees. Crossfeed adjusting screws have Acme threads with adjustable dials graduated in thousands. Four slots in base and key slots for bolting to table.

No. 83 Rotary 8" Table. . . .$49.56
No. 82 Dual crossfeed—without rotary $39.75

IMMEDIATE DELIVERY Write for Circular No. 12 — Order from dealer or direct postpaid if he can't supply.

CHICAGO TOOL AND ENGINEERING CO.
8396 South Chicago Avenue Chicago 17, Illinois
Telephone — Saginaw 9675



DOWELS

Make Your Own

and SAVE

No wanting or waiting for mahogany, cherry, for any dowel with SPEE-DOWL. Let this amazing tool start saving its cost now.

Model 8 (not shown), 2, 3, 4, 5, 6, 7 & 8/16" Only **$1** each size. SPECIAL: 4—**$3.50**; 7—**$6.** Model 20 (shown) **$2.65** each size —9 to 20/16". All 12—**$25.**

Guaranteed. Postpaid in North America.

FREE LITERATURE on this and new never-dull carbide tipped wood-turning tools.

JOHNS MFG. CORP. **Dept. B-14, Dunellen, N. J.**

with the "PENCIL-SIZE" handpiece

4 Reasons Why FOREDOMS ARE TOPS:

1. FOREDOMS give you extra power and longer motor life. Motor not dwarfed to fit hand.
2. FOREDOMS give you correct handpiece size for deft, sensitive, fingertip control.
3. FOREDOMS give you freedom from gyroscopic action: fingertip control for grinding, polishing, de-burring, sharpening, cleaning, slotting, milling, etc. on metals, wood, glass and plastics.
4. FOREDOMS' small handpiece size lets you get into those "hard-to-reach" places.

OVER 60,000 FOREDOMS NOW IN USE.

Get the Flexible Shaft Machine that is fast becoming the standard for the nation. Order NOW for immediate delivery. Prices range from $19.95

Catalog No. 95 on request

FOREDOM ELECTRIC CO.
27 Park Place, Dept. 95, New York 7, N. Y.

STOP LEAKS

In Concrete, Brick or Stone WALLS and FLOORS

Apply Smooth-On No. 7 Iron Cement to cracks, holes, seams and porous spots, using a trowel or stiff brush. The surface to which you apply it may be either wet or dry. In about 24 hours the Smooth-On will have set hard, sealing the leaks. It will stay in place, because it expands slightly as it sets.

Use Smooth-On No. 7 also to line cisterns, swimming pools, troughs, fountains, septic tanks, etc. Use it to seal openings where piping passes through walls.

Buy Smooth-On No. 7 in 1-, 5-, 25-lb. or larger size at your hardware store; if they haven't it, write us.

FREE REPAIR HANDBOOK

40 pages. 170 illustrations. Clear, simple directions for stopping leaks, sealing cracks, tightening loose parts in household equipment and autos. Every home needs this useful repair guide. Just mail the coupon for YOUR free copy.

Sign and Send NOW

SMOOTH-ON MFG. CO., Dept. 58L,
570 Communipaw Ave., Jersey City 4 N. J.

Please send me a Smooth-On Handbook

Name.....

Address.....

11-47.....

Do it with SMOOTH-ON
THE IRON CEMENT OF 1000 USES

Copyrighted material

Give USEFUL GIFTS

"Boys" from 6 to 96 love good hand tools... to use on the job or around the home. For gifts that men prize highly, choose tools. And select the best—Plomb Prime-Quality Tools. Your Plomb Dealer has a complete line in a wide range of prices. See him today. Write for catalog to

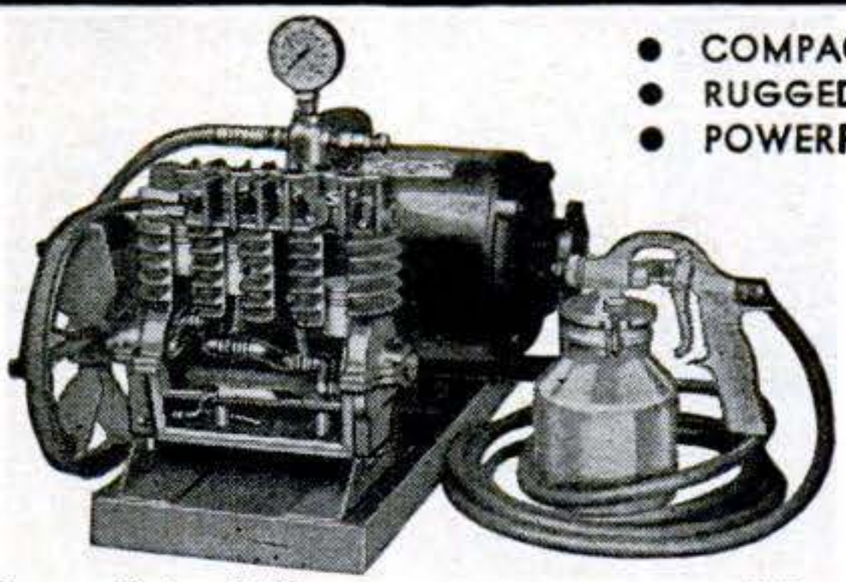
PLOMB
TOOL COMPANY
2257M Santa Fe Avenue
Los Angeles 54, Calif.

4769

PLOMB
Prime Quality
TOOLS

PRESSURE QUEEN

FOUR CYLINDER
PORTABLE AIR COMPRESSOR
SPRAY PAINTING OUTFIT



- COMPACT,
- RUGGED
- POWERFUL

Immediate delivery on compressor with motor

AMAZINGLY LOW PRICED FOR THE ONLY FOUR CYLINDER UNIT ON THE MARKET

The ideal air supply for home and farm workshop, machine shop, garage and contracting painter; for product finishing, inflating tires, painting automobiles, trucks, machinery, etc.

This *4 cylinder compressor* has drop forged crankshaft, stainless steel, heat treated valves; bronze bearings and positive forced feed lubrication. Maximum pressure 50-60 lbs., free from pulsation. Standard equipment includes the compressor mounted on steel base with carrying handle, belt, compressor pulley, air chamber, air gauge, 15-ft. hose, spray gun; ½ or ⅓ h.p. motor or gas engine. Immediate delivery.

If your dealer does not sell Pressure Queen write direct

THE CAMPBELL-HAUSFELD CO.
151 RAILROAD AVE. HARRISON, OHIO

THE **JET** PIPE

So mild you can inhale like a cigarette
No strong odor, light in weight, Drinkless. Honey treated imported Italian briar.

In three popular shapes: Apple, Pear, or Egg.

FACTORY PRICE **$3.00** *POSTPAID*

P. DESJARDINS & SON
33 Webster St. Fall River, Mass.
Pipemakers for 50 years

Craftsmen • Cabinet Shops

6" WOOD JOINTER

"All Aluminum"

$125.00 Value–NOW $75.00

(SEND CHECK OR P.O. MONEY ORDER)

- 41" TABLE
- SEALED BALL BEARINGS
- APPROX. WT. 70 LBS.

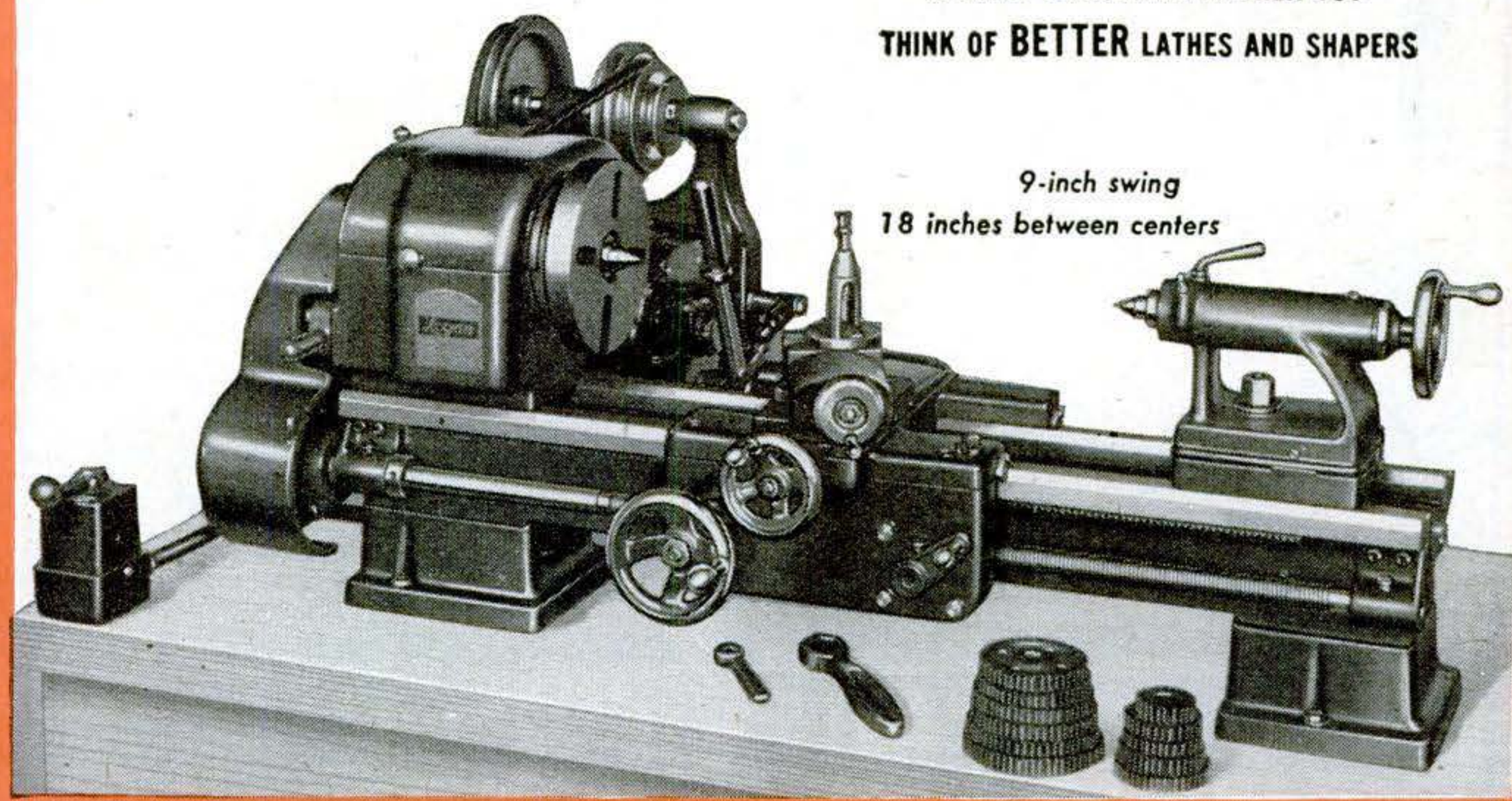
Shipped F. O. B. Portland, Ore.

A B Co. P. O. Box 3871 PORTLAND, OREGON

Copyrighted material

Logan

A NAME TO REMEMBER WHEN YOU THINK OF BETTER LATHES AND SHAPERS



$159.50 A New Low Price for *Logan* Performance In a New 9-Inch Lathe

The Logan 9-inch Lathe is as accurately, ruggedly built as larger Logan Lathes. Whether you use this new 9-inch lathe for precision manufacturing operations, general machine shop and tool room work, maintenance, or as the key tool of a home or farm work shop, it gives you big lathe accuracy and dependability. Its bed ways are machined to within .0005″ of parallelism. Its ball bearing mounted spindle is inherently well adapted to high speed work. Its rugged, rigid construction assures steadiness on heavy cuts. In brief, here is a truly fine small lathe, at a low price that only the most efficient methods of lathe construction could make possible. Complete information at your Logan Lathe dealer's, or on written request.

DISTRICT OFFICES:

WOOLWORTH BLDG.	550 W. WASHINGTON BLVD.	1672 MISSION STREET	700 COMMERCE ST.
NEW YORK 7, N. Y.	CHICAGO 6, ILLINOIS	SAN FRANCISCO, CALIF.	DALLAS 2, TEXAS
CORTLAND 7-8024	CENTRAL 1246	UNDERHILL 6682	CENTRAL 4075

LOGAN ENGINEERING CO., Dept. C-11 CHICAGO 30, ILL.

Copyrighted material

Gift Suggestions FOR HOBBYISTS

MULTI-PURPOSE WOOD PLANER

Fits any drill press. Exclusive hi-speed blade design performs precision surface planing, rabbeting, tenoning, paneling, grooving, routing beading. Thousands now in home workshops, schools, cabinet and pattern shops. An indispensable lifetime tool for wood and plastic workers. Complete $7.50

NEW STYLE DRUM SANDER

Fits any ½" drill press chuck. Used for sanding curves, contours, straight edges. Has many essential workshop applications. Complete with 5 spiral sanding sleeves..... $3.95

4" ROTARY SURFACE SANDER

An exclusive type sander for drill presses, flexible shafts, motors, hand drills. Instantly sands woods, plastics and metals to agate smoothness. No waves, ripples, striations. Discs immediately interchangeable. With 20 discs... $5.95

ALL METAL SHAPER FENCE

Precision built of hard alloy aluminum and steel. Nothing to rust. No wooden parts to warp. For moulding, jointing, shaping, rabbeting, tenoning. Fits all standard drill presses—shapers. Complete with two hold down springs. A real buy at $7.95

AT YOUR DEALER—OR ORDER DIRECT

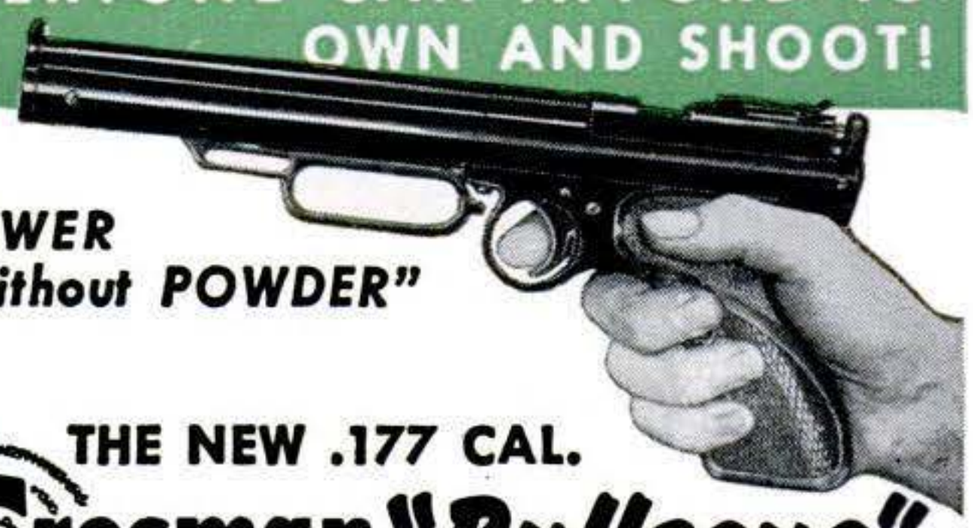
FREE Workshop Catalog →

BARRON TOOL COMPANY, INC.

Architects Bldg., Detroit 1, Mich.

BARRON PRECISION WORK SHOP TOOLS

NOW! A FINE TARGET PISTOL EVERYONE CAN AFFORD TO OWN AND SHOOT!



"POWER without POWDER"

THE NEW .177 CAL.

Crosman "Bullseye"

Now . . . from the makers of the famous Crosman *Silent* Rifle, comes the new Crosman "Bullseye" . . . a single-shot pistol of regulation target type and weight, with the design, quality construction, balance and deadly accuracy demanded by experts. Compare it for performance and thrills. You'll find the Crosman "Bullseye" *the* outstanding value in small arms today.

SEE YOUR DEALER OR WRITE

Using Crosman *Super-Pells*, the better ammunition for all air-powered pistols and rifles, you can shoot the Crosman "Bullseye" for ONLY ¼c PER SHOT!

CROSMAN ARMS CO., INC.

DEPT. 9D, ROCHESTER 7, N. Y.

ASK TO SEE CROSMAN DODO AND BELL TARGETS

Christmas

SURPLUS SALE!

LIKO BINOCULARS

45x3.5

ONLY **$6.98**

BRAND NEW

IMMEDIATE DELIVERY

with COATED OPTICS and Interpupillary Adjustment

First Time in America! Now you can have a close-up of all events with these all-purpose heavy duty binoculars. Precision lenses. Coated optics, interpupillary adjustment and other features found only in high priced binoculars. Carrying case and shoulder straps included. SEND NO MONEY. 10 day no risk money back guarantee. Order today! Ideal gift!

VETERANS EMPORIUM Dept. B-5

1148 W. Chicago Ave. Chicago 22, Ill.

Veteran's Emporium, Dept. B-5,
1148 W. Chicago Ave., Chicago, Ill.

Send me.....Liko Binoculars.

.....Send C. O. D. plus charges.

.....I enclose $..... Send postpaid.

Name.....

Address.....

City.....State.....

Be sure to add 20% Fed. Tax ($1.40)

See Your Favorite Star On Film For Home Use *in*

MOVIE STARS ABOUT TOWN

See your favorite Movie Stars on the streets of Hollywood—intimate shots in dramatic action—sparkling originality.

8mmB&W	25ft—$1.00	50ft—$1.75
8mm K	25ft— 2.75	50ft— 5.50
16mmB&W	50ft— 1.50	100ft— 2.75
16mm K	50ft— 7.50	100ft—15.00

At Your Dealers or Order Direct. Write to:—

HOLLYWOOD FILM ENTERPRISES, Inc.

6060 Sunset Blvd. Dept. 116 Hollywood 28, Calif.

Get an Electric SOLDERING IRON FREE

and assemble your own . . .

Magi-Klips Kit

This is the same MAGI-KLIPS Radio & Electronic Experimenter's Kit—complete with all parts—that we sell ready assembled for $29.75.

In knocked-down form with full instruction for assembly, it is now offered at the new low price . . . **$19.75** complete with a new Electric Soldering Iron—ideal for wiring your unassembled MAGI-KLIPS Kit.

Send for your copy of FREE booklet, "Electronics Made Easy."

DEER & TAYLOR COMPANY

Dept. M. 1342 Milvia St. Berkeley 9, California

Electric WONDER PEN

Burns Beautiful Designs in Wood

DECORATE Leather, Cork, etc. Works like Magic for Lining, Etching, Shading!

Learn in One FREE Easy Lesson

Amaze your friends with this exciting new craftsmanship. Enjoy this magical art for pleasure or profitable income. Make gifts or sell your work direct or to gift shops. With this great electric pen you quickly learn to burn, etch or shade thousands of articles, in gorgeous varied tones of rich sepia brown. Also apply colors, or varnish finishes, etc.

We supply everything in one big Special Gift Offer. You get the only Electric Wonder Pen guaranteed for 800 working hours and 25 accessories. All materials, Tools, 9 Plaques, Book Ends, Brushes, colors, varnish, nails, sandpaper—everything you need—ready for etching plus your FREE easy lesson. A thoughtful gift to any adult or youngster. If your dealer does not have the genuine "Wonder Pen," mail coupon below to us at once.

SPECIAL GIFT OFFER only $3.00 postpaid.

GIRLS, BOYS *You'll Enjoy Painting With Colored Sand!*

Complete only $2.25 postpaid.

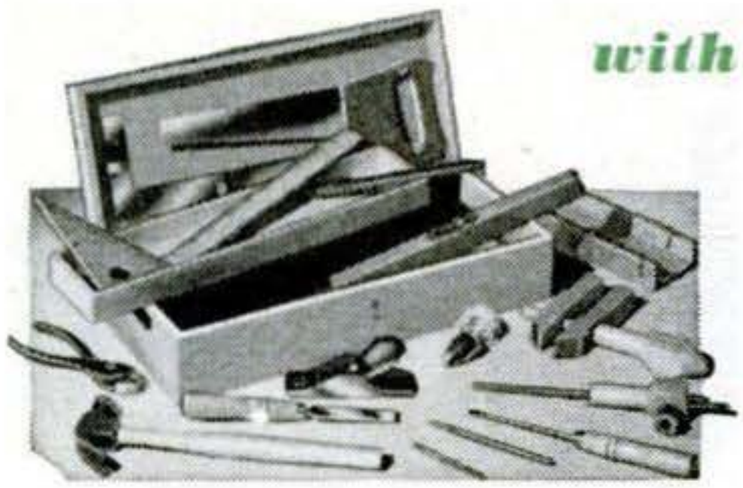
Miraculous Sand Pen does amazing works of art. Easy to do. Get this handsome Gift Box 19 x 11 containing complete set with 5 tubes and 12 boxes of colored sand, a bottle of special adhesive, brush and 12 outline pictures, ready for "Sand Painting." If your dealer can't supply, mail coupon.

Get our General Catalog of other interesting items, mark the coupon

AMERICAN TOY & FURNITURE CO.
6130 N. Clark Dept. 2117 Chicago 26, Ill.

17 QUALITY TOOLS

with DELUXE CHEST



Complete Set only $5.50 postpaid

All at a fraction of the cost if purchased by the piece.

Has tempered spring steel saw, claw type hammer, screw driver, chisel, all with hardwood handles, steel square 8" long, semi-steel pliers, wood level, hardwood clamp, triangle, semi-steel plane, 12" ruler, two steel punches, carpenter pencil, plumb bob, depth gauge, wood miter box. All tools are packed in beautiful Wood Chest with push button lock, hinged lid, end carrying handles of plated steel. Has wood tray 15⅛" long, 3¼" wide. Size of chest 16" long, 6⅜" wide, 3⅞" high. Beautifully lacquered in natural finish. An ideal gift for man or boy. If your dealer does not have this "American DeLuxe Tool Chest," mail coupon below to us.

AMERICAN TOY & FURNITURE CO.,
6130 N. Clark, Dept. 2117, Chicago 26, Ill.

Enclosed is $..... Please send me the items checked. Postpaid.

- ☐ Electric Wonder Pen, $3
- ☐ American Tool Chest, $5.50
- ☐ Sand Pen Outfit, $2.25
- ☐ Send catalog of other gifts.

Name .....

Address .....

City..... Zone..... State.....

(If west of Rockies or in Canada, add 25c to each item)

Gift Mart

SPECIAL BARGAIN PRICES IN

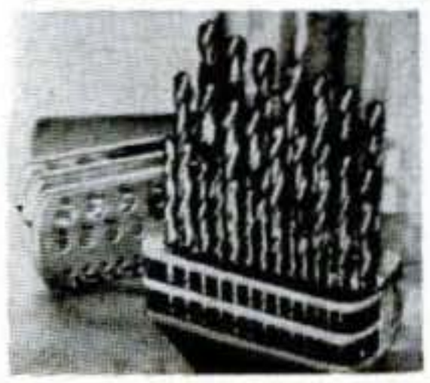
SETS OF CARBON TAPS & DIES

consisting of one each of tap & die 1/72, 2/64, 3/48, 4/48, 5/40, 6/32, 8/36, 10/32, 12/24, (dies 13/16 O.D.) complete with Tap Wrench and Die Stock. **COMPLETE $8.00**

Write for prices & Sizes of individual taps & dies. Enclose 3c for postage.

SEND FOR FREE CIRCULAR

SID TOOL CO. Dept. S1, 183 Grand Street, N.Y.C.



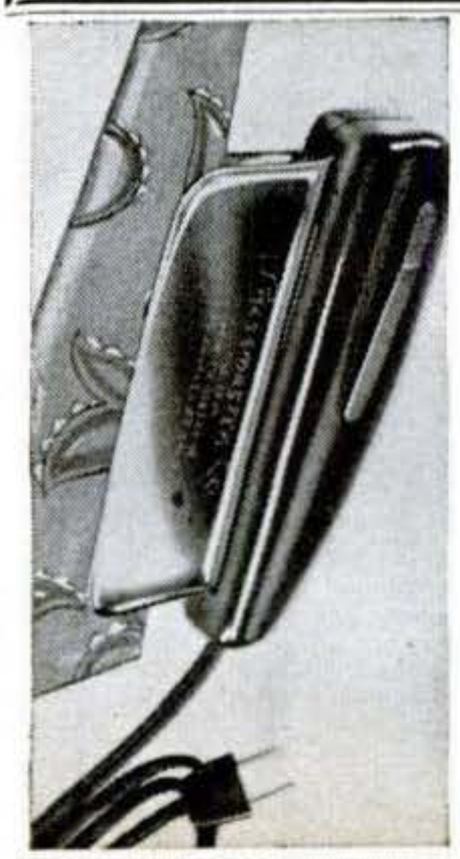
Why Hunt for Drills?

These Complete High Speed Drill Sets Now Available at Low Prices

#1 to 60 Drills.....$12.95 Per Set
1/16-1/2 by 64ths.....$16.95 Per Set
Drill Sets A-Z.....$15.50 Per Set
(Drill Stands Free)

SEND FOR FREE CIRCULAR
Enclose 3c for postage

SID TOOL CO.
MACHINE SHOP SUPPLIES
Dept. S, 183 Grand St., New York 13, N.Y.



A "PRACTICAL"ly Perfect Gift!

PRESSMASTER

QUICKLY PRESSES trousers, ties, sleeves, pleats, etc. No wet cloth or board. Can't scorch or shine. Weighs 8 oz.; uses AC or DC. LIFETIME GUARANTEE. Beautifully packaged . . . $3.95 at better stores or order from

PRESSMASTER CO.
5182 SANTA MONICA BLVD.
LOS ANGELES 27, CALIFORNIA

PLASTIC ICE CUBES

Amazing! Keep beverages COLD the modern way . . . *without dilution.* Use "NICE-CUBES" in highballs, cocktails, beer, wine, soft drinks, fruit juices, milk, etc. Tasteless, odorless, shatterproof plastic cubes with water sealed in, freeze solid in ice-tray. No more "ice-tray mess." Easy to remove—LAST FOREVER. A household necessity! The perfect gift!

BOX OF 8, $2.95

(Assorted Colors or Crystal Clear) ppd U.S.A.

MONOGRAMMED "NICE-CUBES"
Box of 8 (Crystal Clear Only) $3.95
(Limit 3 letters per monogram. Only 1 set of monograms per box.)

"NICE-CUBES"
Reg. U.S. Pat. Off. Patent 1,923,522
8648 MELROSE AVENUE, DEPT. S
HOLLYWOOD 46, CALIFORNIA

Copyrighted material

NO OTHER TOOL LIKE IT

BURGESS vibro-tool

Trade Mark Reg. U. S. Pat. Off.

- WRITES ON STEEL
- DECORATES GLASS
- ENGRAVES JEWELRY
- CARVES WOOD
- TOOLS LEATHER
- CUTS CARDBOARD

Works by Vibration!

Whether you work with metal, wood, glass, plastics or leather, your shop is not complete without a Burgess Vibro-Tool. Totally unlike anything else on the market! Writes like a pencil on hardest steel! Engraves, carves, hammers and cuts. Only $7.50 at your dealer. If he cannot supply you, write to us and we will arrange for shipment.

BURGESS
BATTERY COMPANY
Handicraft Division
Lake Zurich, Illinois

ORDER REPLACEMENT ACCESSORIES NOW!

V 5 Standard Needle . . $0.15
V 3 Heavy Duty Needle. $2.00
V 80 Diamond Point Needle $5.95
V 81 Point for Frosting Glass $0.75
V 82-87 Leather Tools including punch, liner, deerfoot, spoon, double liner and cupper $1.50
V 23 Straight Edge Surgical Steel Knife . . . . . 3 for $0.50
V 24 Belly Edge Surgical Steel Knife . . . . . 3 for $0.50
V 101 Foot Gauge for use with knives to regulate cut depth $0.95
V 51-56 Assorted Carving Chisels . . . . . 6 for $1.50
V 44-48 Assorted Ball Points 5 for $0.95
V 41-43 Assorted Hammer Tips 3 for $0.25
V 115 Sharpening Stone $0.25

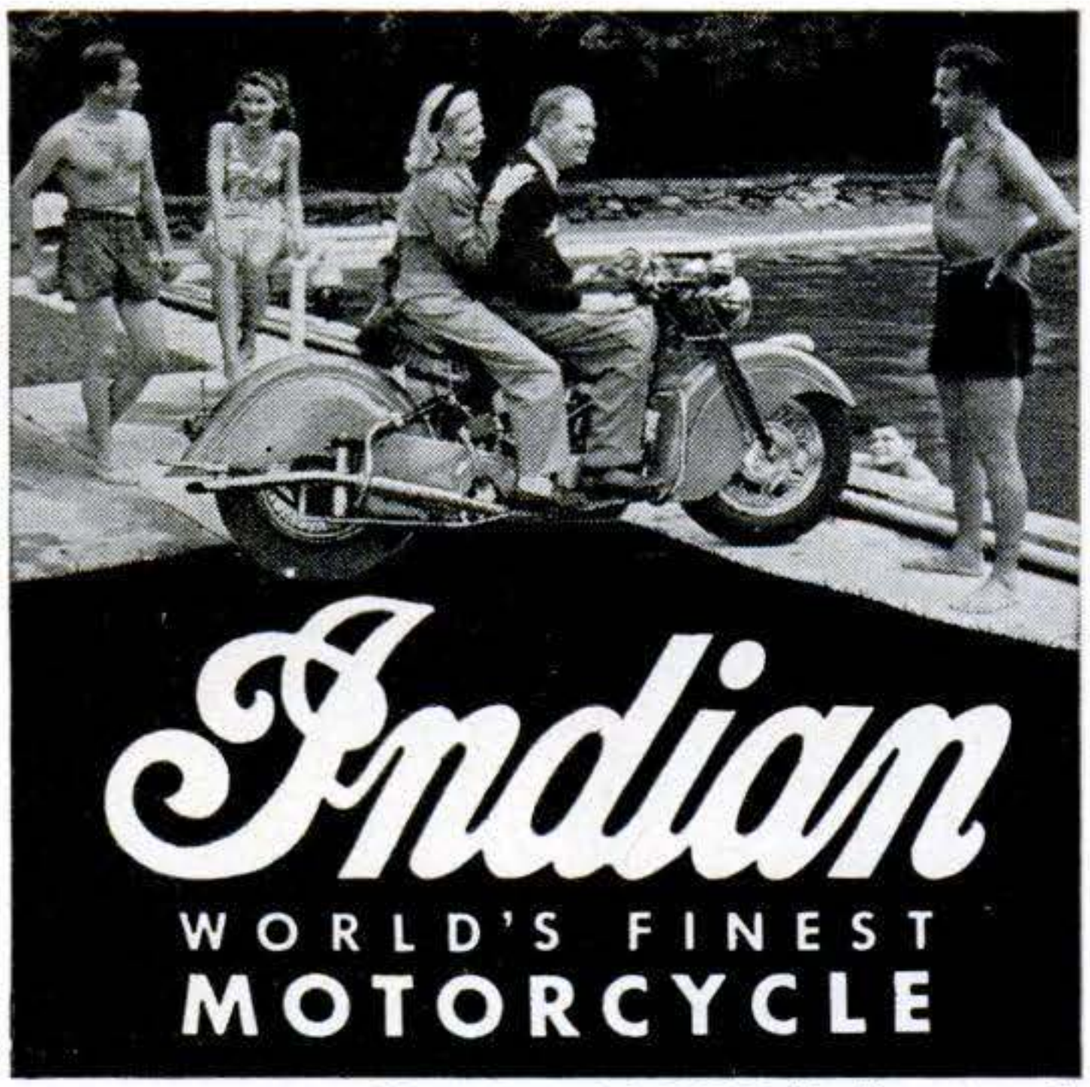
DE LUXE KIT *only* $16.50

Contains Vibro-Tool and 22 attachments, everything necessary for metal marking, jewelry engraving, leather tooling, wood or linoleum carving, pattern cutting, metal embossing, etc. Includes sharpening stone. Each unit individually packed in handsome, natural finish, wood storage chest. An ideal gift for any hobbyist.

BURGESS BATTERY COMPANY
Handicraft Division, Lake Zurich 3, Illinois
Please arrange for a Vibro-Tool dealer to ship the following:

☐ Vibro-Tool ☐ De Luxe Kit ☐ Accessories { Please list parts wanted by number
☐ Enclosed find remittance ☐ Ship C.O.D.

NAME . . . . . .
ADDRESS . . . . . .
. . . . . .



Indian

WORLD'S FINEST
MOTORCYCLE

Send for FREE ILLUSTRATED MAGAZINE, "Indian News"
• • • DEALER INQUIRIES INVITED • • •
Dept. 6CS, Indian Motocycle Co., Springfield 9, Mass.

Please Send 10c for Catalog 102
MEIER BRASS & COPPER CO.
1155 Bellevue, Detroit 7, Mich.

BRASS
For Home Work Shops
Free Cutting Brass Rods
Round, Hex, Sq., ½-Oval
Naval Brass Rods
Round and Hexagon
Brass and Copper Tubing
Brass Sheet

WOODWORKERS . . . Get this
CONSTANTINE MASTER MANUAL

Get the Most Fun From Your Hobby

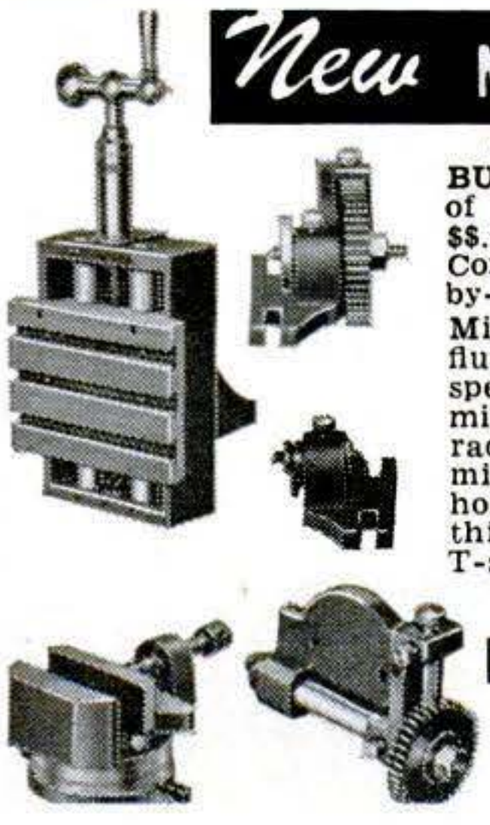
Indispensable to woodworkers. Newest, biggest edition, more pages, more color, helpful how-to-do-it articles, pre-war and new items, more bargains. Send 25c today and we will include ***FREE! FULL YRS. SUBSCRIPTION*** to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

ALBERT CONSTANTINE & SON, Inc.
793-L 135th Street, New York 54, N. Y.

Learn LANDSCAPE GARDENING

A thorough, interesting, home study course for those who wish to become Landscapers, Gardeners, Designers, etc., for profit or pleasure. Write today for Free Book to

APPROVED FOR VETERANS
NATIONAL LANDSCAPE INSTITUTE
Dept. PS-11, 310 So. Robertson, Los Angeles 36



New MILLING ATTACHMENT

Sizes for 8" to 16" metal lathes

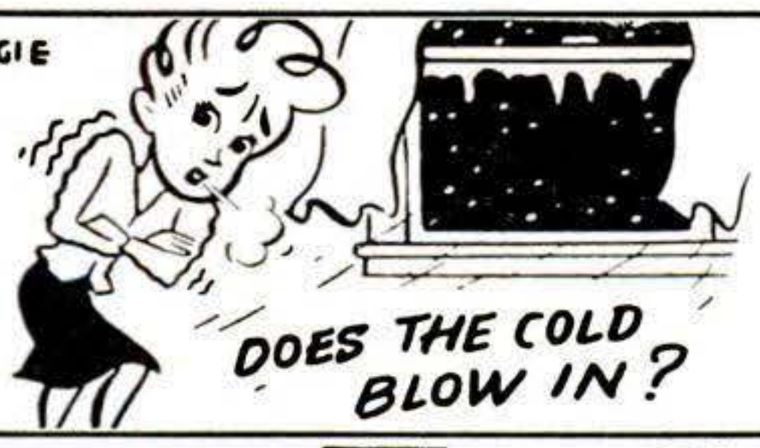
BUILD IT YOURSELF from our sets of semi-machined castings and save $$. Can be finished on your lathe alone. Complete working drawings and step-by-step instructions furnished.

Mill keyways, slots, splines, dove-tails, flutes in reamers, taps, hobs, and special cutters; produce spur, bevel, mitre and worm gears, ratchets and racks; mill flat surfaces, square shafts, mill hexes, spot face, drill spaced holes, bore, etc. on your lathe with this precision attachment. It has a T-slotted table, a vise which swivels for angular milling, a gear cutting fixture and dividing centers.

FREE! Illustrated folder and price list. Includes milling cutters, keyway cutters, drill rod, slitting saws and many hard to get shop items. Mention your lathe. Write today.

HURON MACHINE AND TOOL CO.
YALE 2, MICHIGAN

Copyrighted material



ITS TIME TO WEATHER-STRIP WITH Mortite

KEEP WARM—SAVE FUEL

Don't put up with dangerous, drafty zones in your home when it's so easy and inexpensive to weatherstrip with Mortite. Simply press pliable Mortite around windows, doors, baseboards, etc. It keeps cold out, keeps heat in, shuts out dust and dirt, too! Mortite adheres to any clean, dry surface. No tools, no tacking needed. Anyone can apply it.

3 Sizes: 29c - 98c - $1.25

Higher west of the Rockies and Canada

Get at stores or write for free circu.

J. W. MORTELL CO., 534 Burch St., Kankakee, Ill.

$13.50 Value for Only $2.49

8000 ohm impedance Head Phones, produced to Air and Signal Corps specs. Extremely sensitive, lightweight (only 9 oz.). With 5½ ft. cord, plug, jack and ear cushions. Every One BRAND NEW.

No. 17A37, Special Per Pair..... $2.49

Plus 25c each for Postage.

Burstein-Applebee Co. 1012 McGee, Kansas City 6, Mo.

The Pipeline

PIPES COAL IN! PIPES ASHES OUT!

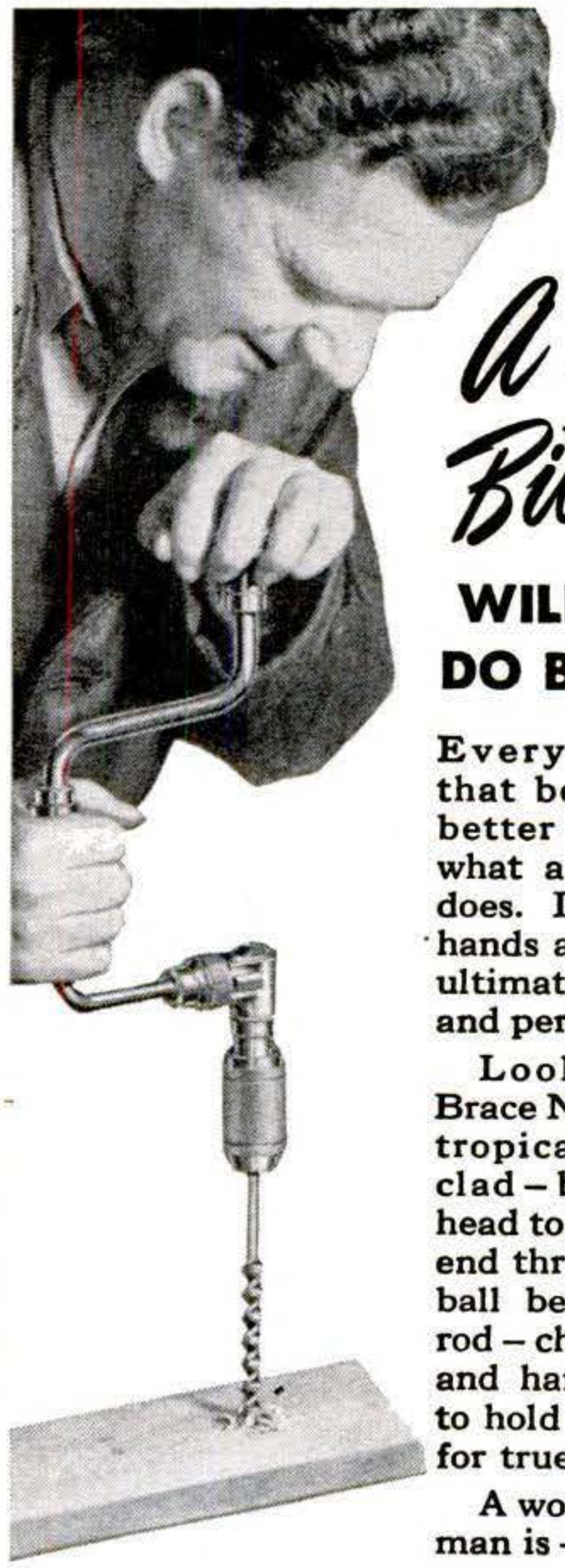
WARMTH WITHOUT WORK

All the work of furnace tending is done automatically by *The Pipeline* Coal Burner. Pipes bituminous coal from any bin to your present furnace, burns it smokelessly and efficiently, and even pipes ashes to dust-proof containers! Modulated warmth regulated by automatic controls.

Conversion models and complete winter air conditioners. Field-tested since 1934. Write for free 20-page booklet.

POCAHONTAS FUEL COMPANY INCORPORATED

Stoker Division • 341 East 131st Street • Cleveland 8, Ohio



A Better Bit Brace

WILL HELP YOU DO BETTER WORK

Every craftsman knows that better tools produce better work. And that's what a Stanley Bit Brace does. It puts skill in your hands and it represents the ultimate in material, design and performance.

Look at Stanley Bit Brace No. 923 – head of fine tropical hardwood, steel clad – bronze bushing in head to minimize wear, with end thrust carried against ball bearings – heavy steel rod – chuck with steel shell and hardened, forged jaws to hold bit or drill securely for true boring.

A word to the wise craftsman is – buy Stanley.

STANLEY
Trade Mark

HARDWARE · HAND TOOLS · ELECTRIC TOOLS

Here are two books well worth owning

The first book is free . . . "The Joy of Accomplishment", a brief introduction to tools and their uses. The second is the famous textbook . . . "How to Work with Tools and Wood", recently revised, fully illustrated. The cost is only $1.

Stanley Tools, 2117 Elm St., New Britain, Conn.

Please send by return mail

☐ FREE booklet: "The Joy of Accomplishment."

☐ 188-page book: "How to Work with Tools and Wood." $1.00 enclosed.

(In Canada: Send order to Stanley Tool Co. of Canada, Ltd., Roxton Pond, Quebec.)

Name.....

Address.....

City..... *State*.....

Copyrighted material

Here's down-to-earth comfort after a hard day in the open. The new **Ta-pat-co**, the **Buoyant Sleeping Bag,** has a soft quilted KAPOK lining that sets your body to rest on millions of tiny air cells. As you stretch out and relax in snug comfort, these air cells gently cushion every tired muscle and protect you from the weather.

On the new **Ta-pat-co** a tough, snag-proof cover turns away wind and cold. A roomy Foot Pocket **lets you rest "foot loose" without cramping or binding. Rolls tight . . . carries light. See the new Ta-pat-co** now — at your sporting goods store.

This **Ta-pat-co Parka** gives you real protection for a day outdoors. It's tailored to fit for comfort and easy movement. It's light and warm.

Wear a Ta-pat-co once, and you'll never be without one!

DON'T MISS IT!

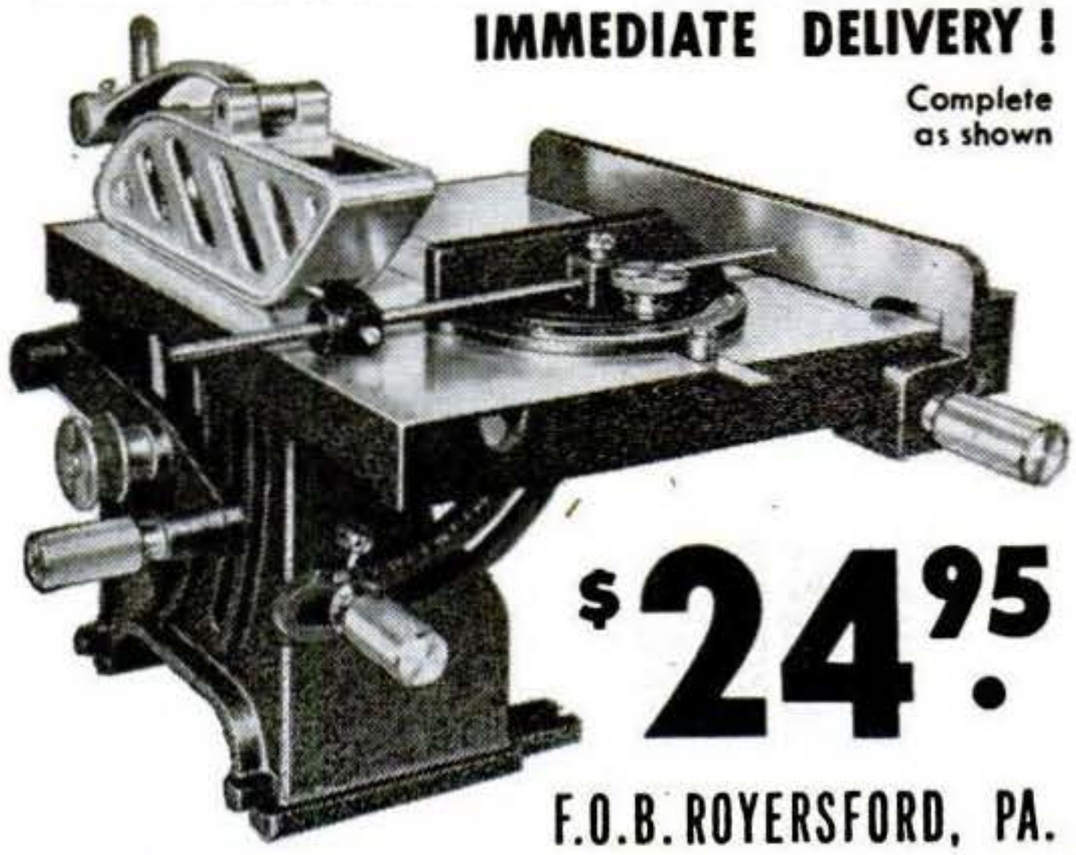
Get Your Copy of This Book!

How to call ducks without a call . . . how to kill a rabbit without a gun . . . how to boil water in a wooden bucket . . . get the answers to these and hundreds of other questions that make outdoor sports more pleasant and successful. Printing limited — be sure to get your copy — send 10c in coin or stamps now to —

The AMERICAN PAD & TEXTILE CO.
Greenfield, Ohio
Canadian Branch — Chatham, Ontario

IMMEDIATE DELIVERY!

Complete as shown



$24.95

F.O.B. ROYERSFORD, PA.

QUALITY 8" BENCH SAW

CUTS THROUGH 2 5/16"

UNCONDITIONALLY GUARANTEED ONE YEAR

(Write for Free Booklet and Guarantee Bond)

Comes complete with Floating motor mount—miter gauge with adjustable stop—aluminum guard—soft aluminum insert—spring steel splitter—heavy gray iron fence—(no motor—no blade). Table 12" x 14". Tilts to 45°—Oilite bearings. Shipping Wt. 50 lbs.

AMERICAN MACHINE & TOOL CO. Inc.

DEPT. 200 **ROYERSFORD, PA.**

TORNADO
GAS TORCH

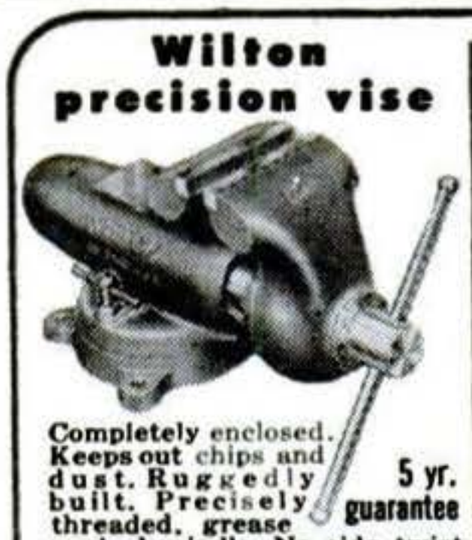
The Modern Way of Soldering

Ideal for hard and soft soldering. Will heat quickly; solder will flow freely and smoothly. No compressed air required. Self-adjusting. Safe. Economical. Can be used for annealing small parts and bending metal parts. Generates a heat of 1700° F. Simply connect to any illuminating gas jet with a rubber hose and operate. Tornado Torch No. 119 comes with three tips, (1/8", 1/4", 3/8" blast).

Tornado Gas Torch No. 119—Complete with 2 tips, for Natural Gas or Bottled Gas; with 3 tips for Manufactured Gas. $2.95 per set. See your dealer or order direct. Send check or money order—post paid.

Robco Corporation, 204 E. 44th Street, New York 17, N. Y.

Wilton precision vise



Completely enclosed. Keeps out chips and dust. Ruggedly built. Precisely threaded, grease packed spindle. No side twist or wobble, no dead motion. **5 yr. guarantee**

Torco utility vise

This low cost bench vise for farm, home and work shop has Wilton Precision features. No dead motion or side play. Pipe jaws optional. *With 3½" Jaws as low as* ***$7.20***

Ask your Dealer or Industrial Distributor

Free Folder Explains Features To Look For In A Good Vise

WILTON TOOL MFG. CO. 936-F Wrightwood Avenue, Chicago 14

WILTON VISES

Built by Wilton—They Must Be Good

Copyrighted material

FASTEST PLANER in the WORLD at this Low Price... $195.00

Belsaw Multi-Duty Planer

Needed by every saw mill owner and woodworking shop to Speed Up Production—Increase Profits. Belsaw high speed thickness planer provided for single surfacing stock up to 12" wide by 6" thick at the high speed rate of 24 lineal feet per minute for HIGH PRODUCTION. **Planes green or dry sawed lumber into higher priced, valuable smooth and worked forms.** Machine has welded all STEEL frame...nothing to break. Safety-type all Steel cutterhead runs in heavy duty ball bearings. Three HIGH SPEED Steel knives make 42 cuts per inch for smooth finish. Belsaw Multi-Duty Planer is REALLY ECONOMICAL ...adequately powered by any motor developing 2 horsepower—REALLY PROFITABLE . . . lowest in investment and operating costs, and takes inexpensive attachments for all common planing mill operations: Jointing, Rabbeting, Grooving, Matching. Produces S4S Finish (surfaced four sides) without the great investment required for S4S Surfacers. **Simple accessories provide for SHARPENING and JOINTING its own knives.** You get BIG VALUE in Belsaw, and provide for your progressive growth. **Write for FREE specifications,** illustrations and low prices.

BELSAW MACHINERY CO. 1022 Field Building
315 Westport Rd., Kansas City 2, Mo.
World's largest manufacturer of light sawmill and woodworking equipment

---

First Choice

Hand and power grinders to fit all needs. Sold at leading hardware stores.

LUTHER GRINDER & TOOL CO.
Sheboygan, Wis.

Luther
HAND AND POWER GRINDERS
Est. 1896

---

35 MILES PER GALLON

If you want real *performance*, choose CROSLEY! This fine, new car reverses the trend toward heavy, cumbersome, expensive automobiles—weighs only about ⅓ as much and operates for about ½ as much as other so-called light cars.

W. G. Reynolds, Route 1, Springfield, Tenn., has driven his Crosley 15,000 miles with an average of 35 to 40 miles per gallon of gas.

And the new CROSLEY truly IS a FINE car. In the convertible or sedan, you get ample room for 4 husky people plus luggage. You get smooth, safe, effortless driving.

In the ¼ ton CROSLEY PICKUP, you get real economy for service calls, light deliveries, etc.

In every CROSLEY you get the startling COBRA (COpper BRAzed) steel engine with 7½ to 1 ratio; delivers 35 to 50 miles per gallon — care-free cruising — lightning pickup.

Sedan lists $888 at factory. Taxes extra.

CROSLEY
a ***FINE*** *car*

For information and literature write: Crosley Motors, 2532-JF Spring Grove Ave., Cincinnati 14, Ohio

---

TRAILER BUILDERS!

Insist on Safety-Engineered

- **Bull Dog Hitches and Parking Jacks**
- **Torq-Less Axles**

HAMMER BLOW TOOL COMPANY
D-17 Wausau, Wisconsin
Send for FREE Catalog

AIR RIFLES BENJAMIN AIR PISTOLS
PIONEERS - LEADERS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY
If you want a REAL GUN for PRACTICAL USE inside or outdoors get a SAFE - CLEAN - ECONOMICAL - BENJAMIN with Adjustable Power and Amazing Accuracy. For BEST RESULTS use BENJAMIN H-C PELLETS. WRITE AT ONCE. BENJAMIN AIR RIFLE CO., 811 MARION ST., ST. LOUIS 4, MO.

HY-ARC "4-PURPOSE" WELDER

IT WELDS • IT BRAZES • IT SOLDERS • IT HEATS
AT A SENSATIONALLY LOW PRICE OF ONLY

Ideal for Home • Shop • Farm • Machinists • Auto • General Repair • Plumbers • Electricians, Etc. $19.95

Radical in construction and design. Successfully used on ships . . . in the field . . . and shops. Works on AC or DC 110 volts. Sold on money-back guarantee. Return set if dissatisfied in 10 days. Send check, money order or $5 deposit. Pay postman $14.95 balance plus small postage charge. Welder sent postpaid if you send check or money order for $19.95 with order.

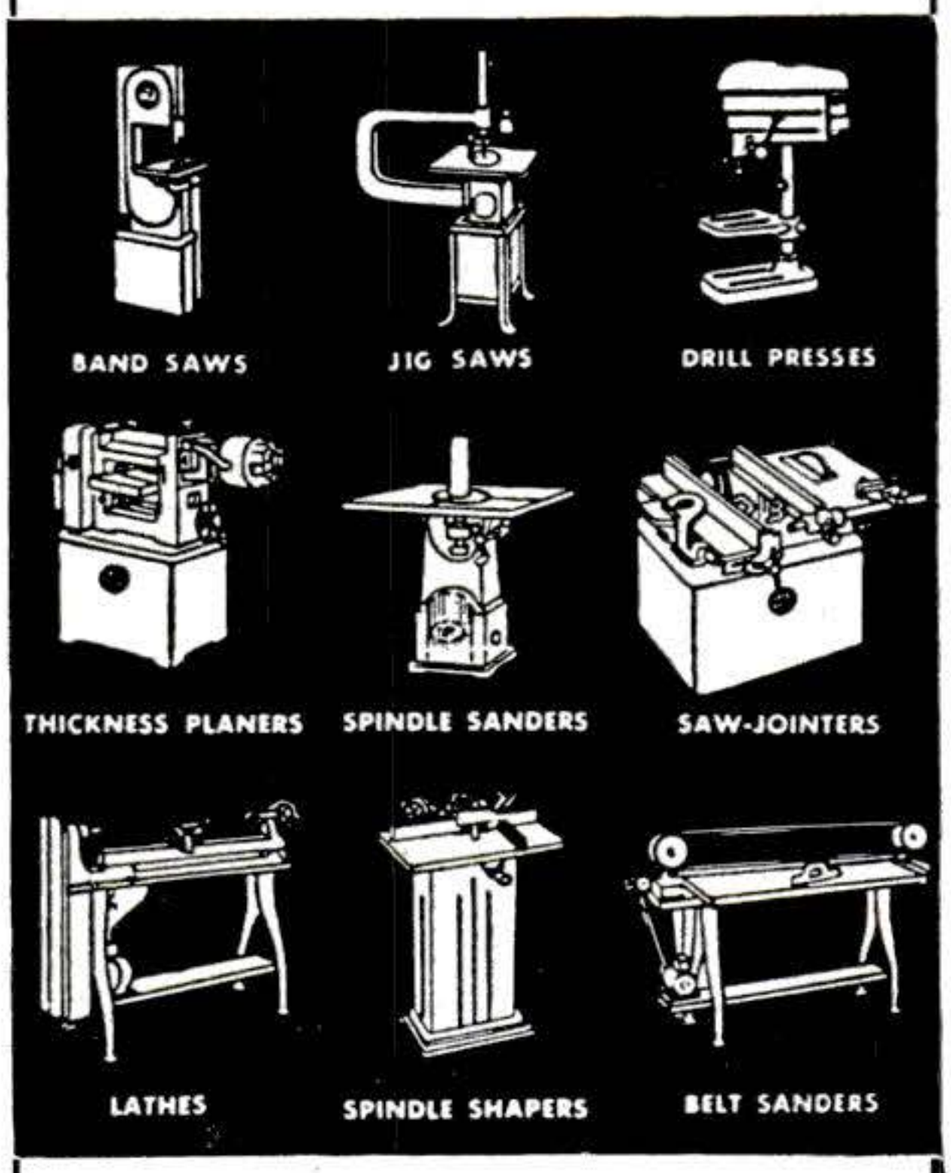
HERE'S WHAT YOU GET WITH THIS OUTFIT!

Set consists of power unit; all metal case, heavy duty carbon arc torch (also to be used as metallic arc electrode holder and ground); also Extra Special welding helmet with unbreakable lens; 1 asbestos block; brazing flux; cast iron flux; ample supply of metallic arc rods; aluminum rods; brazing rods; cast iron rods; copper coated carbons; 6 ft. primary cable; 2 secondary cables with plugs and insulators; complete instruction book. Send in order today.

HY-ARC MFG. CO. Dept. P11. Suite 528
333 N. Michigan Avenue, Chicago, Illinois

Copyrighted material

BOICE-CRANE
POWER TOOLS
for shop men and homecraftsmen.



Write for literature on this versatile, low-cost, sturdy line.

BOICE-CRANE COMPANY
944 Central Ave., Toledo 6, Ohio

FREE!
Write for Handy Chart showing
1948 JOHNSON
Sea Horse Outboard Motors.
JOHNSON MOTORS—500 Pershing Road, Waukegan, Ill.
Johnson Motors of Canada—Peterboro, Canada

Electrically Welded Endless
Paramount
BAND SAW BLADES

Made in widths from 1/8" to 1-3/4"

Make your band saw do more work for you. The proper width of blade will extend the scope of this important machine. Burrill's Paramount Blades are made from tough Nickel Alloy Steel properly tempered. Teeth accurately set and filed, and all saws carefully straightened. Send order and check today. Delivery will be made as promptly as conditions permit, from a few days to a week or two. You can obtain these saws at the following prices:

⅛"-3/16"-¼"-⅜" wide, 5'6" long.....$ .90 each
⅛"-3/16"-¼"-⅜" wide, 6'6" long..... .95 each
⅛"-3/16"-¼"-⅜" wide, 7'6" long..... 1.10 each

Other sizes at proportional prices

NO C.O.D. SHIPMENTS ACCEPTED
State Make of Machine
Your satisfaction is guaranteed

BURRILL SAW & TOOL WORKS
405 E. Main St., Ilion, N.Y.

Take TURNS with a HULL AUTOMOBILE COMPASS

Drive right, without a moment's doubt, with Hull instrument quality. **BEACONLITE** illuminated for night driving, **$5.95; STREAMLINE** standard, **$3.95.** Ideal gifts. At your dealer's. Write for circular.

HULL MFG. CO., P. O. BOX 246-E10, Warren, Ohio

ONE-MAN SAWMILL LESS THAN $200.00
Easy To Turn Trees Into Money

Makes Lumber ties, shingles, crates, lath, studding, siding.

BELSAW MODELS in 10 to 24 foot sawing lengths. **MECHANICAL FEED,** accurate set works and positive dogs. Use tractor or old auto engine for low cost power. Thousands used for commercial sawing. Pays for itself quickly. Send post card today for FREE booklet, "How To Make Lumber" and Catalog of Woodworking Equipment.

BELSAW MACHINERY COMPANY
2846E Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. G.I. Approved. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 83-S, 646 N. Michigan Ave., Chicago 11, Ill.

The Chief's # WORK BENCH

A CHRISTMAS PRESENT HE'D APPRECIATE

Built to Last a Lifetime!

With Bottom Shelf and 18" Sq. Drawer. 2"x6", Solid Plank, Grooved and Dovetailed Top and 1"x8" Back Rail, Shellacked to a Smooth, Satiny Finish.

• 6 Ft. Long • 34" High • 26" Deep. Shipped Knock-down, with Bolts, Nuts and Screws and ABC Chart for Quick, Simple Assembly.

Prompt Delivery

MOHAWK LUMBER CO.
14525 W. Chicago Boulevard
DETROIT 27, MICHIGAN

MOHAWK LUMBER CO. Dept. 34
14525 W. Chicago Blvd. Detroit 27, Mich.
Enclosed ☐Check ☐Money Order for $.....
Ship.....CHIEF WORK BENCHES at
Quantity
$16.95 each, F.O.B. Detroit, Mich.
☐Send C.O.D., $5 Deposit Enclosed.
NAME .....
ADDRESS.....
CITY.....STATE.....
No Priority Necessary!

Send Check or Money Order, or Will Ship C. O. D. ($5 Deposit)

Copyrighted material

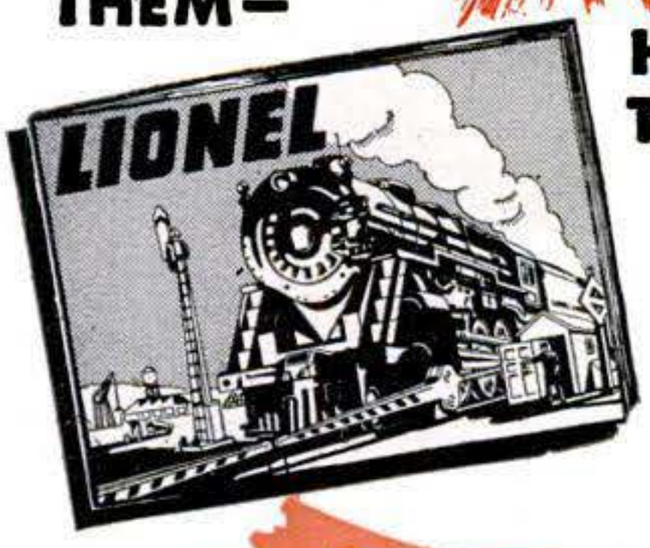
Send for LIONEL Catalog and Sound Effects Record

Here's one of the most unusual offers ever made. Now you can SEE and then HEAR the new LIONEL TRAINS in action! Not only are we providing a magnificent 32-page, full color catalog, but we have also created a remarkable Sound Effects record so that you HEAR Lionel Trains whistle and thrill to the excitement of model railroading—the LIONEL way. The 1947 Lionel Trains are the most extraordinary ever made. SEE them! HEAR them!

SPECIAL OFFER

For only 25c we'll send you the 32-page, full color catalog, the Sound Effects record with narration by Bill Stern, famous sports commentator, PLUS a 32-page "Fun with Lionel Model Railroading" book, a R. R. Guide Wall Chart and a model layout blue print. It's a great package!

SEE THEM—



HEAR THEM—

4-inch Sound Effects Record narrated by Bill Stern, famous sports commentator. Official R.R. whistle signals on reverse.

LIONEL

LIONEL TRAINS, Box No. 419
Madison Square Station, New York 10, N. Y.

Please send me offer checked below. Complete special offer of Catalog, Sound Effects Record, Fun Book, Wall Chart, and Ideal Layout — all for 25c.

☐ I enclose 25c for Special Offer. ☐ I enclose 10c for catalog only.

NAME_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

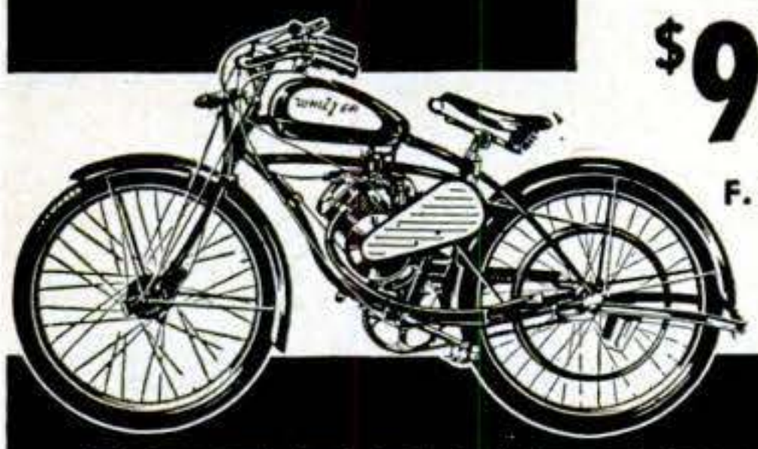
Copyrighted material

RIDE IT... AND YOU'LL BUY IT!

HERE'S WHY! A Whizzer Bike Motor takes you 125 miles on a gallon of gas! It's precision-engineered! Fits any man's balloon tire bike! Complete with all attachments necessary to motorize your bike! See your local Whizzer Dealer!

$97.55 PLUS TAX

F. O. B. Pontiac, Michigan



WHIZZER

Whizzer Motor Company, Dept. 5311, Pontiac, Michigan.

I enclose $99.97, which includes $2.42 Federal Excise Tax ( ) check or ( ) money order. Send me one Whizzer Motor complete, ready for installation. If descriptive literature only is desired, check here ( ).

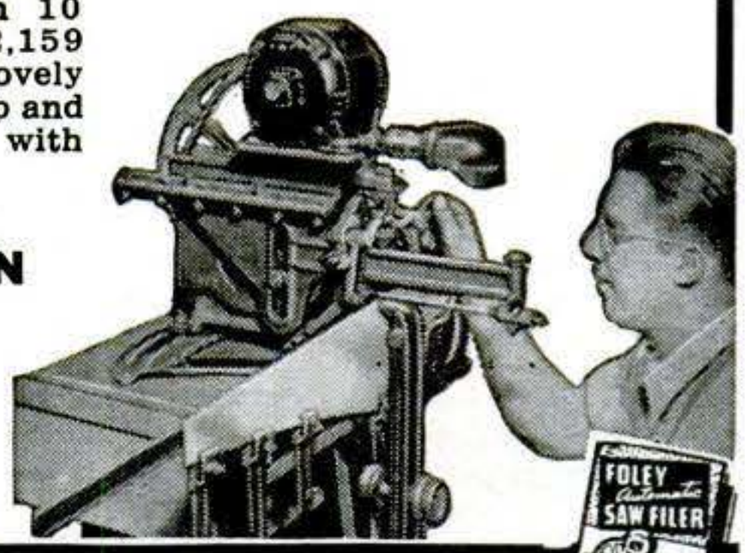
Name_____ City_____

Street_____ State_____

Start a SAW REPAIR BUSINESS!

MAKE A GOOD LIVING IN YOUR OWN BUSINESS—sharpening saws with the Foley Automatic Saw Filer. It makes old saws cut like new again. All hand saws, also band saws and cross-cut circular saws can be filed on this ONE machine.

THERE ARE HUNDREDS OF SAWS TO BE FILED in your own neighborhood, used by farmers, carpenters, homes, schools, factories, etc. W. L. Tarrant writes: "I left my old job last September and in 10 months have filed 2,159 saws. We have a lovely business worked up and cannot keep up with the work."



Send for FREE PLAN

Shows how to start this steady cash business. No experience needed. No eyestrain, no canvassing. Send coupon today.

FOLEY *Automatic* SAW FILER

FOLEY MANUFACTURING CO.
1119-7 Foley Bldg., Minneapolis 18, Minnesota
Send Free Plan on Saw Filing business, no obligation

*Name*_____

*Address*_____

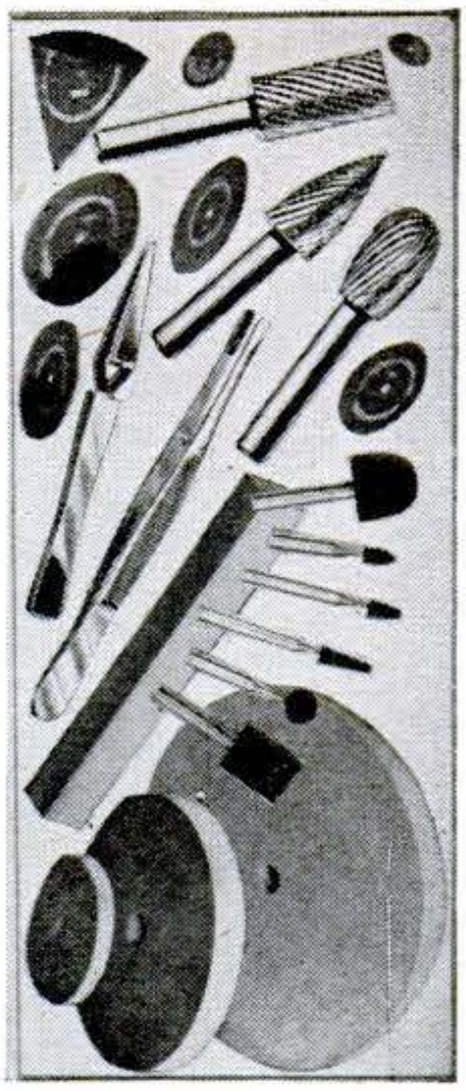
A BONANZA FOR THE HOME WORKSHOP

ACTUALLY $50.00 WORTH OF

GRINDING WHEELS

Abrasive discs, felt and buffing wheels, mandrels, rotary files, sheets, etc.

327 PIECES
ASS'T. SIZES
FOB CHICAGO
ALL FOR ONLY $6.95



The buy of a lifetime! 327 pieces including 35 ass't. Grinding and Cut-off wheels up to 10 inches diameter, 1/16 to 1¼ in. face, ⅛ to 3 in. holes. Assorted grits—all brand new—made by Norton, Carborundum, Macklin, Bay State, etc. Also included are 100 slotted disc cloths; 100 paper discs; 3 round wire brushes on handles; 2 felt bobs; 2 felt wheels; 1 4" rag buff; 3 honing stones; 10 abrasive sleeves; 10 mounted stones, ⅛ and ¼ shank; 2 mandrels; 2 rotary files, ¼ shank; 50 abrasive discs; 2 72" abrasive belts; 5 9x11 abrasive sheets. Satisfaction guaranteed. Order today. It's better than a $50.00 value for only..... **$6.95**

GROBAN SUPPLY CO. 1522 SO. MICHIGAN AVENUE DEPT. PS-11, CHICAGO 5, ILL.

148 PAGE WOODWORKERS CATALOG

ONLY 15 CENTS-REBATED ON FIRST ORDER

SHOWS IN NATURAL COLOR

22 inlay and overlay insets
32 veneer bandings—matched woods
30 kinds of world's finest woods in character grains and color
31 mouldings, rosettes, ornaments and home wood working labor-saving tools and hard-to-find hardware.

LISTS OVER 300 PIECES OF ARTISTIC FURNITURE SHOWN including cost of plans, lumber, hardware and finishing material. Choice of MAHOGANY, WALNUT, BIRCH or MAPLE LUMBER—PLYWOOD—VENEERS. UNEQUALLED BARGAINS.

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. B-87, Chicago 8, Ill.

Make beautiful furniture at only 20% store prices.

CRAFTSMEN . . .

We offer you hundreds of craft materials, supplies and accessories:

- PLASTICS
- POWER TOOLS
- PLYWOODS
- PLASTIC LEATHERS
- JEWELRY FINDINGS
- MARINE PLYWOOD
- BOAT KITS

Send 10¢ today for latest big 64-page illustrated catalog.

CARMEN-BRONSON CORP.
162 So. Fulton Ave., Dept. DS-1, Mount Vernon, N. Y.

$$$$ if trained in arc welding

Big income jobs await you. Learn quickly and thoroughly. Enroll under G. I. Bill. Write today.
Hobart Trade School, Inc., Box P-563, Troy, O.

GET A GENUINE DELTA REDDYlite ELECTRIC LANTERN

6-volt. Shoots beam 800-ft. Light revolves in a circle—"stays put" at any angle you set. Dozens of uses. Buy at hardware, sport, and electrical stores.

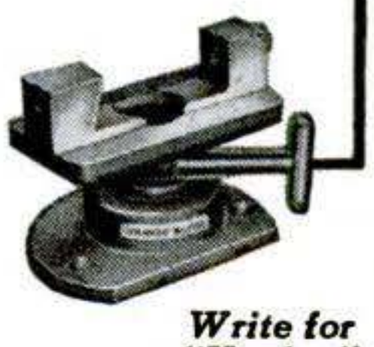
$2.98 Less battery

Delta ELECTRIC CO. Marion, Indiana

Copyrighted material

"YANKEE" VISES

hold work through every step without a misstep



Any job locked in a "Yankee" Vise, is correctly positioned for every operation . . . hand or machine. Lifts on and off swivel base at bench. Machined accurately . . . top, bottom, sides and front end . . . V-grooved block for rounds. Four sizes, with and without swivel base . . . 1½", 2", 2¾" and 4" jaw widths. At your dealer's.

Write for "Yankee" Tool Book

NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

YANKEE TOOLS NOW A PART OF STANLEY
THE TOOL BOX OF THE WORLD

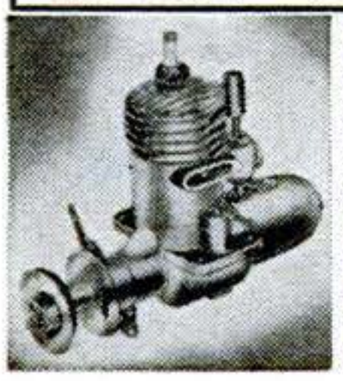
26" OPERATING SCALE MODEL SUBMARINE

Heavy duty spring motor drives twin propellers thru sealed gears, running in oil. Water ballast chamber & air control valve for diving. Runs on surface or under water. Kit includes complete parts for spring motor & gear drive unit, completely formed Aluminum hull & diving fins. Plastic conning tower, naval gun & drive shaft brackets. Brass propellers & trim. **Send 3c stamp for catalog.**

If your dealer cannot supply you order direct

WESTLAKE MODEL CO. Dept. PS 117 Erie, Pa.

REAL GAS ENGINE $6.95



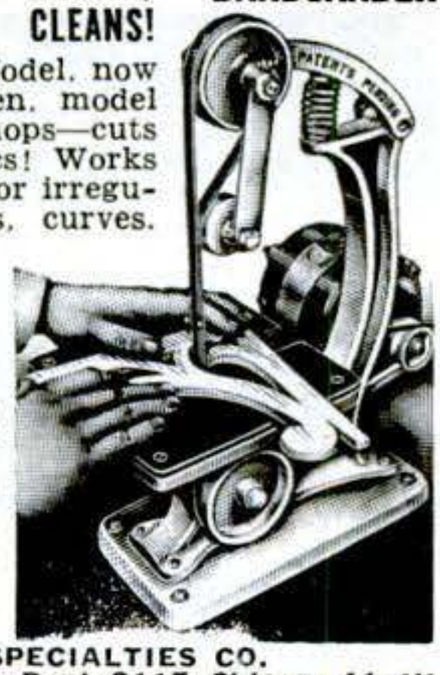
The new THOR "B"—Sensational miniature gasoline engine that **really** works. Super-power performance. Smooth, velveted power that roars into action with a "twist of the wrist." Over 25,000 already sold. 1/6 H.P. Complete with coil and condenser. Ready to run, only $9.95. In KIT form, fully machined, 5 minutes to assemble, $6.95, without coil and condenser. Powers all models. Fully illustrated instructions. Send $1.00—shipped collect same day C.O.D. **FREE.** Send for 24-page Illustrated Hobby Catalog.

AMERICA'S HOBBY CENTER
Dept. S-117, 156 W. 22nd St., N. Y. 11

NEW TOOL READY

QUICKLY SHAPES, SANDS, CARVES, PROFILES, GRINDS, BEVELS, SMOOTHS, POLISHES, CLEANS!

BANDSANDER



New Bandsander Economy Homeshop Model, now **again available** to hobbyists, craftsmen, model makers, pattern makers, home workshops—cuts fast and clean on wood, metal, plastics! Works equally well on **inside** cut-out openings or irregular outside edges, on intricate scrolls, curves. Saves hours of tiresome hard work—does better job. Nothing else like it. IDEAL TO GIVE OR GET FOR WORKSHOP! Sold on 5 Day's Trial, money back GUARANTEE.

FREE!

Write for free, lavishly illustrated Circular describing how Bandsander—the machine that amazed the experts—saves time, money, trouble. Write—a post card will do! (Dealers wanted)

MEAD SPECIALTIES CO.
4114 N. Knox Ave., Dept. 2117, Chicago 41, Ill.

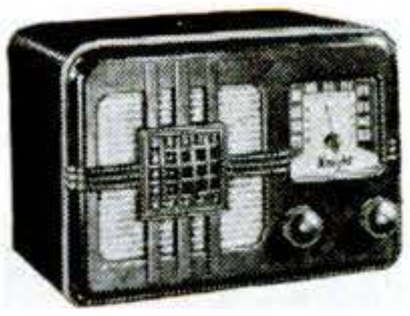
FREE!

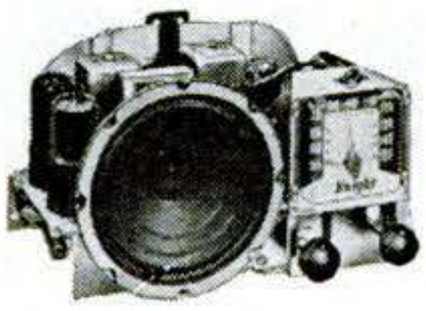
SEND FOR ALLIED'S BIG 164-PAGE RADIO CATALOG

Everything in Radio at Lowest Prices!

Here is *everything* you want in Radio! New home radios and phono-radios, Ham receivers and gear, new kits, thousands of parts, tubes, tools, complete PA equipment, diagrams, latest radio books. The most complete stocks anywhere—in one *big* book—all at money-saving low prices!

BUILD THIS AMAZING 5 TUBE RADIO





LOW-COST SUPERHET KIT
Complete with Plastic Cabinet, Loop Antenna, and Tubes

It's here! The first ultra-modern 5 Tube AC-DC Superhet kit at so low a price! Here's what you get—full broadcast band coverage (550-1600 Kc); built-in loop antenna; latest 5" PM dynamic speaker; handsome walnut plastic cabinet. Unbelievably easy to build; no special tools required. Sockets are riveted in place on chassis base; just assemble, wire and slip into cabinet. Outstanding for power and tone quality. Highest grade components only. Complete with all parts, tubes and full instructions. Nothing like it at the price! Shpg. wt., 10 lbs. **ONLY $14.95**
No. 83-275. Complete.....

GET THESE VALUABLE *ALLIED* RADIO BOOKS!

Radio Formulas & Data No. 37-752....10c
Dictionary of Radio Terms No. 37-751 ..15c
Radio Circuit Handbook No. 37-753.....25c
Radio Builders' Handbook No. 37-750 ..15c
Simplified Radio Servicing No. 37-755...10c
Radio Data Handbook No. 37-754.....25c
ALL 6 BOOKS above No. 37-799.....$1.00
Parallel Resistance and Series Capacitance Calculator. No. 37-960....25c
R-F Resonance and Coil Winding Calculator. No. 37-955.....25c

ALLIED RADIO

ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-L-7
Chicago 7, Ill.

FREE CATALOG

☐ Rush FREE 164-page Catalog
☐ Send Kit No. 83-275
☐ Send 6 Books No. 37-799
☐ Send Calculators checked above
} $.....enclosed

Name.....
Address.....
City.....*Zone*.....*State*.....

Copyrighted material

Save Time on Routine Jobs

with an AUTOMATIC SCREW DRIVER

Whether it's light production assembling or a routine home workshop job, you can save a lot of time with a Millers Falls Automatic Screw Driver. This unique spiral ratchet tool can handle any screw driving job quicker and easier. By simply shifting the knurled control sleeve and the spiral lock nut, it can be used either as a regular rigid screw driver, a right or left hand ratchet, or as a complete automatic. Made with or without quick return.

Smooth, powerful action and tested dependability are built right into Millers Falls Automatic Screw Drivers. You can depend on them for long-lasting satisfaction. Ask to see one at your dealers today.

One thing in common—Quality

MILLERS FALLS TOOLS
SINCE 1868

MILLERS FALLS COMPANY
GREENFIELD • MASSACHUSETTS

BOATS for Home Assembly

"U-MAK-IT"

KAYAKS, ROWBOATS, DINGHIES, INBOARDS, OUTBOARDS, RUNABOUTS

Cut-To-Fit for Quick Assembly. Everything Complete plus Illustrated Instructions. No Experience Necessary. Simple as A. B. C.

SEND 25c POSTAGE (COIN) TODAY
FOR 3 MONEY SAVING ILLUS. CATALOGS
Showing all '47 Models (marine plywood) and construction details.

AQUAMOBILE V-18

Designed for Auto Engines. Open or with cab. Length 18 ft. Fast VEE Bottom Hull.

KAYAK BOAT CO., 703R-WHITTIER ST., N.Y. 59, N.Y.

Sand Casting—Forging—Heat Treating—Case Hardening

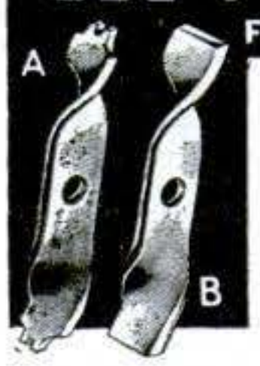
BRONZE FOUNDRY

is again available in limited quantity without priority. Orders filled in sequence as received. INVENTORS-SCHOOLS-CRAFTSMEN use FOUNDRYETTE for making castings quickly for new inventions, for instruction, and general purpose. Order now for early delivery. Three sizes are available capable of making bronze castings of 1½, 3, and 6 pounds weight, aluminum, copper, brass, etc. Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.

KANSAS CITY SPECIALTIES CO.
Box 6022, Dept. S-14 Kansas City, Mo.

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide $1.50. 1½ in. $2.00. Jointing cutters, B 1 in. $1.50. 1½ in. $2.00. E 1 in. for drop-leaf tables, $1.50. E 1½ in. Makes ¾ in. cove & Quarter. $2.00. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM
Rt. 1-P. Clearwater, Fla.

FREE!
FAMOUS
BLUE BOOK
CATALOG

GAME SUPPLIES

Club Furniture - Counter Games - Punchboards - Magic Cards Readers, Read the backs - Inks - Daubs - Poker Chips - Tops Flats - Layouts - Game Boxes.

K.C. CARD CO., 838 South Wabash Ave., Chicago 5, Ill.

L*M

CARBIDE SCRIBER

NON-MAGNETIC

Tungsten Carbide — carefully ground on diamond laps, brazed into stainless steel 6" handle for marking steel and other metals — for etching, marking, cutting glass. In plastic case with pocket clip.

$2.00
PRICE POST PAID

PRICK PUNCH

Tungsten carbide tip, silver brazed into 3½" heat treated steel body.

with Carbide Tip.... $1.50
Price Post Paid

LUCAS-MILHAUPT ENGINEERING CO.
5051 SOUTH LAKE DRIVE • CUDAHY, WISCONSIN

Copyrighted material

Just Out! *New* CONCORD

RADIO Catalog

The ONLY Complete Up-to-the-minute Catalog of RADIO PARTS • RADIO SETS KITS • HAM GEAR • TESTERS

The greatest, latest complete presentation of radio, electronic and television equipment and supplies in Concord history! Packed from cover to cover with thousands of items—160 pages of everything in Radio and Electronics. Special bargain section of hundreds of money-saving values. Scores of new items from famous makers. Parts, blueprints for famous Popular Mechanic and many other kits. Write for your FREE copy. Please address Dept. PS-117.

CONCORD RADIO CORP.

LAFAYETTE RADIO CORPORATION

CHICAGO 7 901 W. Jackson Blvd. — **ATLANTA 3** 265 Peachtree Street

Ottawa Self-Propelled Buzz Master

CLEARS LAND FAST! Powerful 7-HP motor with friction clutch for safe operation. Cuts down timber, brush and hedge; turn blade vertically and saw logs to length. **Also furnished with post hole diggers.** Has clutch pulley for belt work.

No Other Like It!

OTTAWA MFG. CO., 1-701 Brush Ave., Ottawa, Kansas

BRUNO EXPANSIVE BITS

NEW DESIGN!

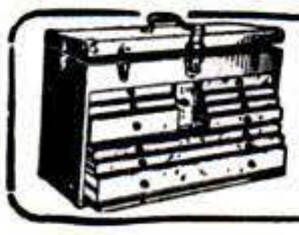
For professional and home use! Cut holes to any depth in wood fast and smooth . . . special lead screw gives faster starts.

No. 200-B2, 3/4" to 1 5/8", $2.45
No. 201 B2, 1 1/2" to 3 1/2", $3.45

MONEY BACK GUARANTEE

BRUNO TOOLS, BEVERLY HILLS, CALIF

At dealers everywhere



TOOL and DIE MAKERS

Better tool chests for your good tools, shown in free catalog.

GERSTNER TOOL CHESTS
547 Columbia St., Dayton 7, Ohio

Gift suggestion

FOR CAMERA ENTHUSIASTS

WESTON

Master II

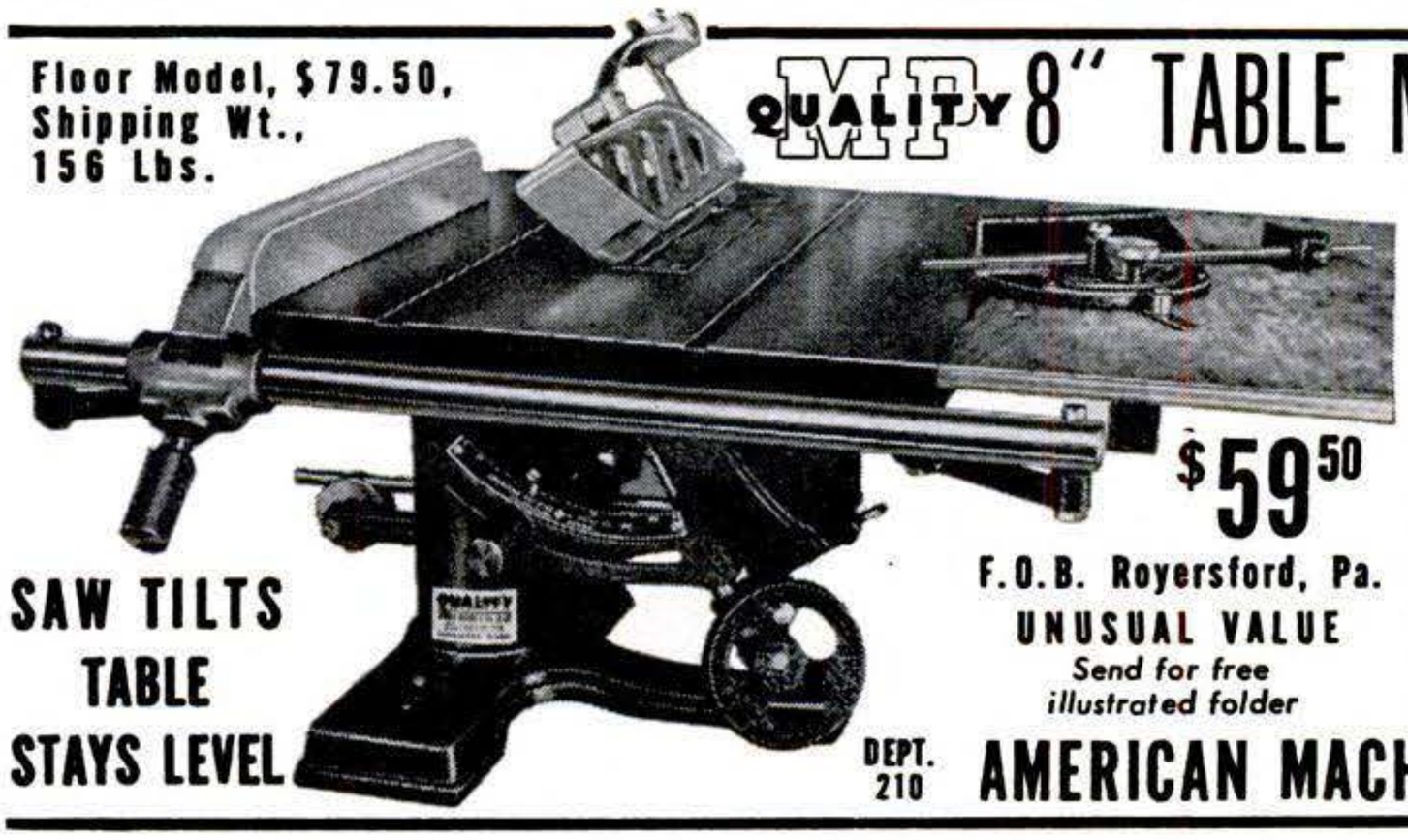
EXPOSURE METER

No gift will bring greater joy . . . no exposure meter greater satisfaction, than a WESTON. For all cameras, all films. Ask your photo-dealer to reserve one in gift wrapping today.

The Meter Most Photographers Use

Floor Model, $79.50, Shipping Wt., 156 Lbs.

QUALITY MP 8" TABLE MODEL TILT-ARBOR SAW



SAW TILTS TABLE STAYS LEVEL

UNCONDITIONALLY GUARANTEED 1 YEAR

Complete as shown with Trans-axial Ball Bearing Motor Drive, Ball Bearing Saw Arbor, Table including extension 18" x 25", Aluminum Fence & Saw Insert, Complete Mitre Gauge, Precision Segments on Mitre Gauge and Cradle. • Cast Iron table extension bracket furnished. Will support plywood top much larger than 9" x 18". Motor pulley and belt furnished. Blade and motor not included. SHIPPING WEIGHT 118 LBS.

$59.50

F.O.B. Royersford, Pa.

UNUSUAL VALUE

Send for free illustrated folder

IMMEDIATE DELIVERY

DEPT. 210 **AMERICAN MACHINE & TOOL CO., INC.** Royersford, Pa.

Copyrighted material

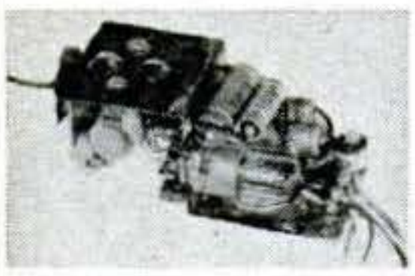
MINE DETECTORS

AN/PRS1

Hundreds of uses. Used by U.S. Army. Will indicate buried objects, both metallic and non-metallic. Includes Detector unit and amplifier, all tubes, cables, etc. Wooden case.

New, complete **$12.75**
With Batteries **$21.65**

RADIO-SONDE TRANSMITTER



T-49/AMT 1

Used by many weather services for gathering weather data aloft. An ideal unit for a portable fly-weight transmitter or walkie-talkie. Original operation on 72.2 Mc., but simple conversion adapts it for amateur frequencies. Comes in a weather proof container. Size: 4½"x2"x2". New, complete with 3A5 tube..... **$2.75**

Headsets

H.S. 30 Miniature Headsets. A comfortable, high efficiency unit. Plug in phones reduce outside noise to a minimum and low impedance (500 ohms) assures high fidelity. Order today!! With 6 Extra prs. of ear plugs... **$1.00**

Matching transformer 5,000 ohms to 500 ohms ..... **$.50**

DYNAMIC MIKE

and headset combination. Used in U.S. Army Tank transmitters. Sound powered, no batteries required. Use as intercom for home, office, factory. Mike and earphones, complete. New **$2.75**

Cross-Pointer Indicator

Used by U. S. aircraft as landing indicator. Two 0-200 microammeter movements in 3" bakelite case. New—Has many uses. Only **$1.89**

GIBSON GIRL

Emergency Transmitter

The transmitter that saved thousands of Airmen's lives in the war. Sends out automatic SOS signal on 500 Kc. emergency wave, and can be manually keyed to transmit further information. No batts. required. Hand generated. A MUST for every boat **$25.00**

MODEL-MAKERS, *ATTENTION!*

Fractional H.P. motors for running small drills, grinders, etc. Extended 7/32" shaft allows for any attachments. Size: 6"Lx4"-Hx4"D. Special, while they last, only **$4.95**

PE 73 CM Dynamotor: Input: 28 VDC, Output: 1,000 VDC @ 350 Ma. Completely enclosed starting relay and filter. Power supply for BC 375.

$5.95

BD 77 KM, Dynamotor power supply for BC 191 Transmitter. Input: 14 VDC. Output: 1000 VDC @ 350 Ma. Completely enclosed starting relay and filter

$5.95

ALL MERCHANDISE GUARANTEED. Mail orders promptly filled. All prices F.O.B. New York City. Send Money Order or Check. Shipping charges sent C.O.D.

COMMUNICATIONS EQUIPMENT CO.

131 - P Liberty St., DIGBY-9-4124, New York City 7, N.Y.

MARINE SURPLUS SPECIALTIES

BARGE PROPULSION UNITS—Gasoline and Diesel outboard motors for barges 50 ton and up.
CHRONOMETERS—Elgin and Waltham, low prices.
LIGHT PLANTS—Fine small 500 Watt, 110 V., D. C. gasoline driven sets for camps or cottages, 3000 Watt sets for power tools, etc.
DIVING EQUIPMENT—Shallow Water and Deep Water Rigs—New and used at considerable savings.
NAVY CLOCKS—Seth Thomas and Chelsea—Zig-Zag.
RUBBER GUNNING BOATS—1 or 2 man, oars & oarlocks.
PELORUSES, COMPASSES and NAUTICAL NOVELTIES.

For complete information send 3c stamp

SLEEPING BAGS—100% Down filled AAF heavy (25 lb.) bag including snap-in blanket—used, cleaned, good condition $19.55 shipped via express.

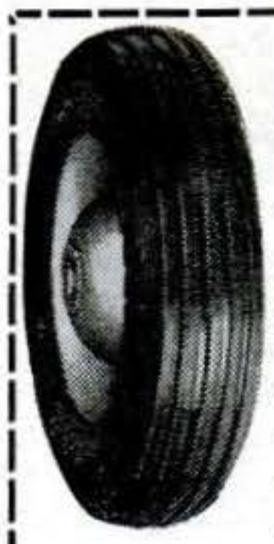
M & E MARINE SUPPLY CO.

P. O. Box 601-G **Camden, N. J.**

Table Top MODEL RAILROAD!

Imagine a roaring locomotive in the palm of your hand . . . cars not much bigger than this ad . . . all exact scale models that operate electrically on 15/32" track. You can have a whole layout on a card table or desk. Equipment easy to build from kits, or may be obtained ready-to-run, including freight and passenger cars, steam and diesel engines, track, etc. See your Hobby Dealer or send dime for illustrated circular and price lists.

H. P. PRODUCTS CO., Hartford City, Indiana



WHEELS
AT BARGAIN PRICES

...4" wheel & tire, 5/16", sleeve bearing & hub cap ..... $0.45 ea.
...5" wheel ⅝" solid tire 5/16" shaft hole.... 0.65 ea.
...6" wheel ⅝" solid tire 5/16" shaft hole.... 0.75 ea.
...7" wheel ¾" solid tire ⅜" shaft hole..... 0.85 ea.
...8" wheel 1" solid tire ½" sleeve bearing.. 1.25 ea.
...8 x 2" wheel, semi-pneumatic tire 7/16" ball bearing..... 2.50 ea.
...10 x 1.75 wheel semi-pneumatic tire 7/16" ball bearing..... 3.25 ea.
...12 x 1.75 wheel semi-pneumatic tire 7/16" ball bearing..... 3.50 ea.
...10 x 2.75 wheel semi-pneumatic ⅝" ball bearing..... 5.75 ea.
...6 x 2" wheel ⅝" ball bearing, solid tires.. 3.95 ea.

BUILD YOUR OWN Wagons, Scooters, Soap Box Racers, Welding Carts, Baby Pens, etc.

To order above wheels write number wheels wanted in space provided, tear out and mail this ad with check or money order and your name and address. If other sizes are wanted write for FREE LIST.

TRULSON MFG. CO., 811 E. 31 St., Dept. P-6, Kansas City, Mo.

STENCIL-SETS

BRAND NEW

ALL LETTERS A to Z NUMERALS 0 to 9

A bargain sensation! Complete stenciling outfit—with interchangeable letters, numerals and punctuation. Complete with stencil brush and stencil paste—all in a fine, natural finish wooden box—all brand new.

HAS HUNDREDS OF USES

In factories, stores, home work shops, farms—there are hundreds of uses for a stencil outfit. Put your name, address, identifying numbers, etc. on all your personal belongings—boats, ladders, shipping cases, etc. These sets are brand new. Only because they're surplus can you buy them at so low a price. Send your order today! Post paid in U.S.A.

SET IN 1 IN. SIZE COMPLETE, ONLY $2.50

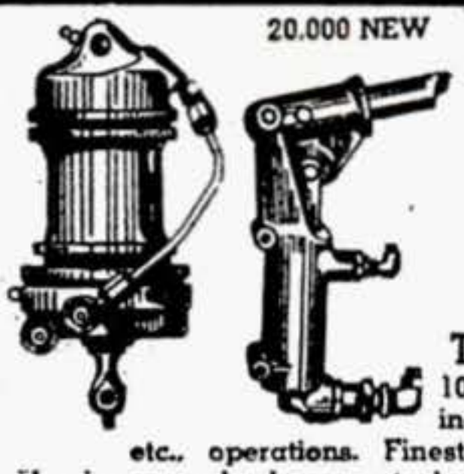
SET IN 2 IN. SIZE COMPLETE, ONLY $3.95

GROBAN SUPPLY CO., Dept. PS11
1522 S. Michigan Ave. CHICAGO 5, ILL.

Copyrighted material

SAVE UP TO 85% in WAR SURPLUS...SENSATIONAL VALUES at "GADGETEER'S HEAVEN"

IN MANY ITEMS WE HAVE THE WORLD'S LARGEST SUPPLY



20,000 NEW

HYDRAULIC Cylinders, Valves, Pumps, Fittings Hose Tanks

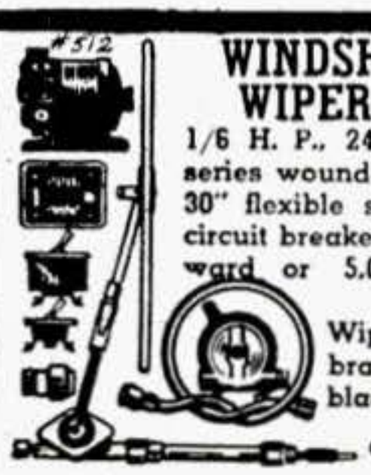
New! 51 sizes & types.

The World's Largest Supply

1001 LABOR SAVING ADAPTATIONS for pulling, pushing, pressing, lifting, tilting, squeezing, etc., operations. Finest precision workmanship. Aircraft alloy of aluminum and chrome steel, guaranteeing trouble-free operation. Liquid and or air operation, developing terrific power.

PRICE TO SELL AT 15% GOVERNMENT COST!
WRITE FOR CATALOGUE.

WINDSHIELD WIPER KIT



#512

1/6 H. P., 24 volt, D. C. series wound motor, with 30" flexible shaft, switch circuit breaker, 10,000 forward or 5,000 reverse R. P. M. Wiper & wiper bracket, arm blade & switch. only **$7.95**

OPTICAL GYROSCOPE!

#150 MARK 18 GYRO-SIGHT An engineering marvel worth hundreds of dollars! - Our Price $8.95

#102 $1.95

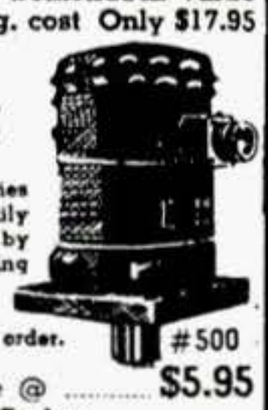
AIRFORCE GUNSIGHT #102 Contains triple lens. #103, N8A with polarizing variable density lens $2.95. Lenses in these sights are worth many times the entire cost of these items.

#506 COMPRESSOR

Complete With Tank And Fittings. General Electric, 2 stage AC - DC. Rated pressure 1000 lbs. per sq. in., with 1/3 H. P. 27 volt, 7 AMP series wound motor, equipped with fan for cooling.

Thousands now in use for spraying, inflating, laboratory use, etc. Can be adapted to 110 volt A. C. with transformers or 4 1000 heating elements. A tremendous value at approx. 5% of orig. cost Only $17.95

Electric Motors



#500 New ½ H. P., 27 volt D. C., 24 volt A. C.

This motor is series wound and can be readily adapted to 110 A. C. by simple method of re-arranging armature brush leads. We furnish free diagram with instructions with each order.

#500 A Sensational Value @ **$5.95**

#501 1/6 h. p. 24 V Series Wound New **$4.25**

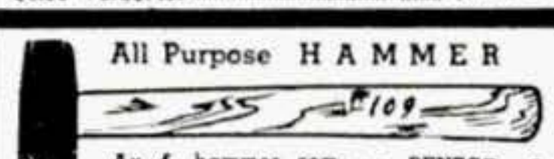
2 h. p. 24 V D. C. motor used **$8.95**

PEXTO SIDE CUTTING PLIERS

#121

Beveled head, lap joint. Size 8-500. Cuts wire, solid grip, alloyed steel. Ideal for home, electrical, or shop use. A $3.50 value! for **$1.95**

All Purpose HAMMER



#109

PENTCO #107

Ax & hammer combination for wood & metal work. 3½ lbs. 14½" hardwood handle, hard steel cutting edge. **69c**

Compound Action METAL SNIPS

Hard steel blades. Expansion spring. Locking device.

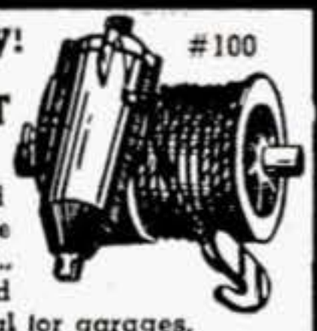
Now **$2.59**

BEARING MIX

Needle, ball and roller bearings in excellent assortment. Sizes from 1/2" to 2".

#170 Introducing this treasure shelf assortment of 15 Bearings at **$2.95**

A Real Buy! A 1001 USES! WINCH HOIST



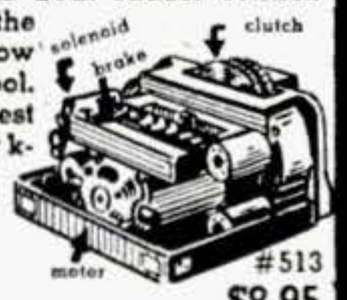
#100

Capacity 2500 lbs. Controlled worm gear drive winch, with 19 ft., ¼" diam. alloyed steel cable. Ideal for garages, truck loading, machine shops, boat building, etc.

#100A Without handle $10.75
#100 With handle $12.50

Electric **GYRO PILOT** Assembly Part 2 solenoids for reverse and forward motor control. 2 solenoids throw clutch to engage drive. With brake assembly. Can be used as boat rudder control, converted for lathe tapping and slow speed motor tool. Wt. 29 lbs. Finest precision workmanship.

Cost Gov't. Thousands!



#513

Your Cost **$8.95**

NEW AMPLIDYNE MOTOR-GENERATOR

#511

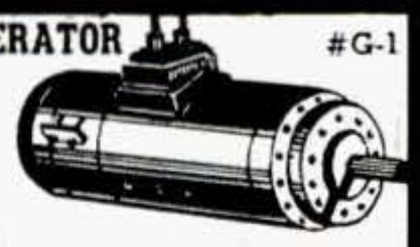
With 24 volt current it gives 60 volt output. This unit has been adapted to independent and rural lighting power.

Welding and many other uses. Weight 29 lbs.
Gov't. Cost Approximately $237.00!

A Steal at **$8.95**

DC GENERATOR #G-1

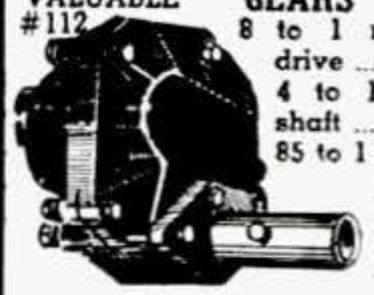
140 AMP Direct Current



Generator, especially suited for adaptation to homemade welding unit.

A fast moving item at **$15.95**

VALUABLE GEARS BARGAINS!



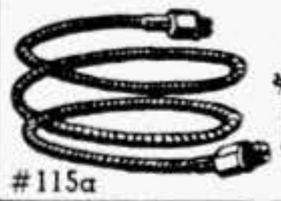
#112

8 to 1 ratio, spindle drive ..... #110 $2.98
4 to 1 with screw shaft ..... #111 $4.98
85 to 1 (can be used for radio, antennae, etc.) #112 **$3.95**

2 to 1 ratio 90° right angle #113 10 tooth bevel steel boxed gear **$4.95**
113a 6 to 1 ratio 90° right angle **$4.95**

Flexible Gear Shafts With End Drives
115 ———— 30" $1.00 each
115a ———— 60" $1.50 each

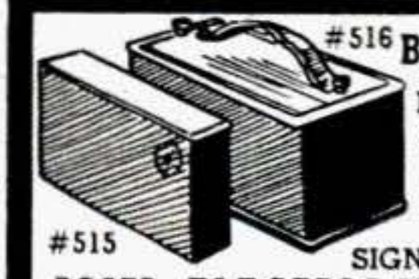
Radio tuning shafts that can be used as flex gear drives *115a 12 ft- ½" nut --15 tooth internal spline $2.50 ea.



#115a

*115b 25 ft- ½" nut 12 tooth with internal spline **$4.25**

#516 BATTERIES



#515

NEW! FULL STRENGTH FOR PORTABLE RADIOS, SIGNAL LAMPS, BOATS, ELECTRIC TRAINS, ETC.

#516 9 Volt 8½ x 6 x 4 in. .....3 run
24 or 27 Volt motor 79c

These batteries are especially suited to portable radios.

#517 67½ & 1½ Volt Battery **69c**
#515 90 & 1½ Volt **69c**

HOBBYISTS! An Unequalled Value! GADGET MIX

Rivets, spacers, Clamps, bolts, nuts, Radio parts, gears, etc.

#106

A gold mine ..... 5 lbs. **$1.19**

Radio ANTENNA Reel

#711

Just the thing for tuning beam antenna.

Powered by ½ h. p. 24v G. E. Motor. Removable 6" Reel-limit Switch - Cam Worm gears, Bevel gear. Solenoid clutch.

Motor engaged to gear reduction only when electrical contact made. Operates in either direction. Ideal for auxillary power take-off, opening and closing doors, etc.

A TREMENDOUS VALUE **$4.95**

CLAMPS

#121

Adel Aluminum, rubber lined. Mixed. #121 4 dozen **89c**

Aero-Seal. Rust Resistant. Slotted with screw gear top. ½" to 3".

#120 Regular 27c now 10c

SPRING MIX

Torsion, compression and tension springs. Assorted sizes. #206

2 lbs. 89c

A treasure shelf for emergencies!

ORDER DIRECT FROM THIS AD

All sales final. Make remittances by money-order, bank draft or personal check. Purchase orders acceptable from D & B firms. All quotations F. O. B. Los Angeles.

BIG ILLUSTRATED CATALOGUE AVAILABLE

Send ⅓ deposit with C. O. D. orders. Also Aircraft Supply Catalogue

Pneumatic RIVET GUNS

Pistol & Gooseneck Type

101 Uses. Chipping, Riveting, Hammering, Breaking cement and auto body work.

Chicago Pneumatic, Cleco, Ingersoll Rand Makes.

E3, E2, 3X, 2X, OY
$55 Value
$8.95

#186 Squeezer — PNEUMATIC ALLIGATOR SQUEEZER — $80 Value **$15.95**

AIR DRILLS

CLECO ARO INGERSOL RAND CHICAGO PNEUMATIC

#196

¼" JCB Chuck

Straight **$12.95**
Angle Drill **$15.00**

#197 ELECTRIC DRILLS

CHICAGO PNEUMATIC
BLACK & DECKER

110 V. A.C. 50/60 cycle. ¼ drill bit & JCB Chuck. Both side and trigger handle. High Speed. For commercial or home use. The best there are.

Gov't. Cost Approx. $60.00
- also - 220 v. a. c. #197g

A TERRIFIC VALUE $17.95

NEW PRESSURE TANKS

Stainless steel - Shatter proof. Rustless. 10,000 available in 3 different sizes. 1001 uses.

G-1 12½ x 24 inches - 2100 Cu. in. capacity 29 cu. ft. **$4.75**

D-2 6½ x 24 in - 500 Cu. In. capacity - 7 cu. ft. **$2.25**

F-2 6 x 45 in. - 1000 Cu. In. capacity - 14 cu. ft. **$3.95**

Perfect portable air tank to carry in car or trailer. Ideal for painting cooking, spraying, ocean buoys

OUR PALLEY SPECIAL ELECTRIC SOLDERING IRON

#198

110 Volt A. C. "SOLDER MASTER"

$8.50 Value **$2.95** 200 AMP.

FIRE EXTINGUISHER

#601

Kiddie Lux CO2 Type

Built to Gov't. Spec. 4 lbs. Trig. con. with horn, fully Rechgd. $30.00 value #601 **$10.75**

2 LB. CO2 TYPE
$22.50 value #602 **$8.75**

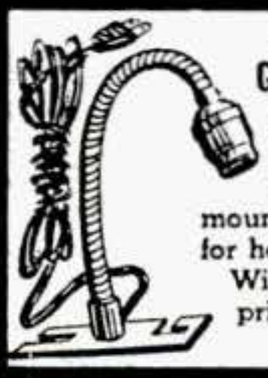
10 lb. Chgd. CO2 with Horn
$60.00 value #603 **$24.50**

15 lb. Chgd. CO2 with horn.
$80.00 Value #605 **$27.50**

NEVER AGAIN A BUY LIKE THIS!

indispensable for small or large planes, trucks, auto, home, factories.

NEW FLEXIBLE GOOSENECK LAMP



110 V. A. C. 13 ft. wire with socket, switch and plug. In mounting bracket suitable for home or workshop.

Wire alone worth our price of **.99c** each.

RUBBER GOODS

24 x 24 in. ½" thick. $1.95 Soft & springy. Ideal foot-mat for workers who stand on their feet..... Cashiers, Demonstrators, machinists, etc.

NEOPRENE SHEET RUBBER

	Thickness	approx. Width		Price per rnng. yd.
#323	.015"	1/64	36"	.60
#325	.020"	1/64	36"	.75
#326	.037"	1/32	36"	1.25
#327	.064"	1/16	36"	1.75
#328	.175"	3/16	42"	6.00

PALLEY SUPPLY CO.

THE LARGEST FIRM OF ITS TYPE IN THE WORLD

DEPT. P.S. 117 — 6321 SAN FERNANDO RD.
GLENDALE 1, CALIFORNIA

SHOPMASTER 15" JIG SAW

$19.95

$21.50
West of Denver.

SPECIFICATIONS
on
Model # L-684

★

Table size .....10" x 10"
Table tilt .....45°
Blade to frame..15"
Height .....16"
Length .....25"
Weight .....15 lbs.

★

Extra
Jig Saw Blades
50c per dozen.

Replacement parts available.

MEETS every demand for unexcelled wood working. Features outstanding simplicity and performance, new style blade support, efficient blower, mechanism encased in oil, rigid, light weight construction.

For professional and amateur Wood Craftsmen, Hobbyists, Home Work Shops, Schools, Pattern Shops, Cabinet Shops, Factories!

AN IDEAL XMAS GIFT!

MAIL ORDER NOW.
Enclose Check or Money Order.
Shipped pre-paid to any point in U.S.A.

HICKS WOODCRAFT TOOL CO., Inc.
311-313 E. WASHINGTON ST., INDIANAPOLIS 4, IND.

Now for EVERY WORK SHOP!

NEW Invention

Electroplates by BRUSH

Easy to Plate CHROMIUM
GOLD, SILVER, NICKEL, COPPER
. . . For Pleasure and Profit!

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal . . . Gold, Silver, Chromium, Nickel, Copper or Cadmium. Method is easy, simple, quick. Everything furnished—equipment complete, ready for use. *By doing a bit of work for others, your machine can pay for itself within a week.* So make your shop complete by getting a Warner Electroplater right away. Send today for FREE SAMPLE and illustrated literature. ACT AT ONCE! *Mail Coupon.*

WARNER ELECTRIC CO., DEPT. P-5
1512 Jarvis Avenue, Chicago 26, Ill.

FREE *Details & Sample!*

WARNER ELECTRIC CO., 1512 Jarvis Avenue, Chicago 26, Dept. P-5
Gentlemen: Send Free Sample and Details to:
*Name*_____
*Address*_____
City *State*

CROSMAN *Silent* RIFLE

Most Amazing Gun Ever Invented for Target and Small Game Shooting

The ideal rifle for year 'round shooting indoors or out. Shoots low-cost SUPER PELLS without noise, odor or recoil. Requires no cleaning. At your dealer or write direct.

Adjustable power—rifled barrel for accuracy. .177 and .22 caliber models. Write for information.

CROSMAN ARMS CO., INC.
9D HENRIETTA ST., ROCHESTER 7, N. Y.

Shoot CROSMAN SuperPells

The BETTER Ammunition for ALL .177 and .22 caliber Air Pistols and Rifles.

.177 cal... $2.50 per M
.22 cal... $3.00 per M
POSTAGE PREPAID
At your dealer or order direct

FOR GREATER ACCURACY • MAXIMUM POWER

CROSMAN ARMS CO. HENRIETTA ST., ROCHESTER 7, N.Y.

MACHINE SHOP EQUIPMENT

Just off the press!—Every man who owns a workshop should have a copy of our new, up-to-the-minute, 200 page catalog of Machine Shop Equipment—the latest tools made by the biggest manufacturers in the U. S. Replete with illustrations, descriptions, prices. Prompt delivery on most tools listed in this book. Available at cost of printing—50c a copy—get yours today! **Price of Catalog Refunded on First Order over $5.00.** Send Check or Money Order to

CENTER TOOL CO., 153 Centre St., Dept. D, N. Y. C. 13

NEWEST OTTAWA LOG SAW

SELF-PROPELLED — MOVES ANYWHERE on OWN POWER

World's fastest Log Saw. Powerful 6 H-P air-cooled motor. Attachments for sawing down trees, buzzing limbs, post hole digging and pulley for belt jobs. Big demand for wood, pulp, posts. Make big money sawing wood this easy way. Low factory-to-user prices. Nothing like it. FREE details.

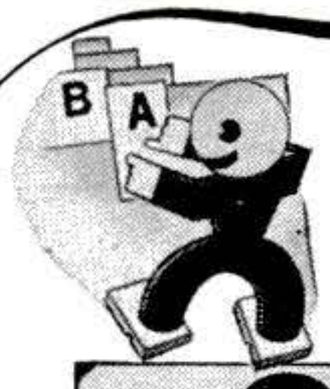
OTTAWA MFG. CO., 7-701 Pine St., Ottawa, Kansas

Everything in Radio!

Make **Radolek** your buying headquarters for Radio-Electronic repair and replacement needs. Large stocks assure finest, most complete selections of all available items at lowest prices. Your orders receive special attention for fastest delivery. Send today for FREE **Radolek Buying Guide.**

RADOLEK CO., Dept. A-132, 601 W. Randolph St., Chicago 6, Ill.

FREE RADIO BUYING GUIDE



What gives each file
a guiding mark
Like lighted street
signs, after dark?

Dennison
INDEX TABS
At Stationery Departments Everywhere

Copyrighted material

$65,000 IN AWARDS FOR BOYS

More than 700 awards—8 university scholarships, $1,000 to $4,000 each, cash awards, trips—in the Fisher Body Craftsman's Guild 1948 model-building competition

Michael Welther
Detroit, Mich.
First award,
$5,000 Scholarship

Douglas C. Brown
Hatboro, Pa.
Second award,
$3,000 Scholarship

Donald F. Schonholtz
Hutchinson, Kans.
Duplicate first award;
$5,000 Scholarship

Charles Jordan
Cambridge, Mass.
First award,
$4,000 Scholarship

Wm. Bowman
Bell, Calif.
Second award,
$3,000 Scholarship

Donald A. Stumpf
Buffalo N. Y.
Second award,
$2,000 Scholarship

Robert Welther
Detroit, Mich.
First award,
$5,000 Scholarship

James Mariol
Canton, Ohio
First award,
$4,000 Scholarship

John R. Chadima
Cedar Rapids, Iowa
Duplicate first award;
$5,000 Scholarship

Philip Rauth
York, Nebr.
Second award,
$2,000 Scholarship

Major Award Winners 1947 Competitions

Any boy 12 years old or over and not yet 20 on September 1, 1947, may enter the competition to design and build a model car. Junior and Senior Divisions with identical awards let you compete with boys your own age. There are no dues or entrance fees, and awards include Model Builders' Tool Chests, cash, all-expense trips to the Guild convention, and 8 university scholarships worth $1,000 to $4,000 each. (Duplicate awards are given if sons of General Motors employes win.)

Judges include deans or presidents of 10 leading technical schools and universities.

Write for free membership. Each new member receives a membership card and button, a full set of plans and instructions, *all free*. Competition closes July 1, 1948. *You* can win one of these awards! Mail the coupon NOW and get started.

FISHER BODY CRAFTSMAN'S GUILD

Sponsored by: Fisher Body Division of General Motors
General Motors Bldg., Detroit 2, Michigan

Gentlemen: Enroll me in the Fisher Body Craftsman's Guild 1948 Model Car Competition. Send me full instructions without charge.

Name_____

Address_____

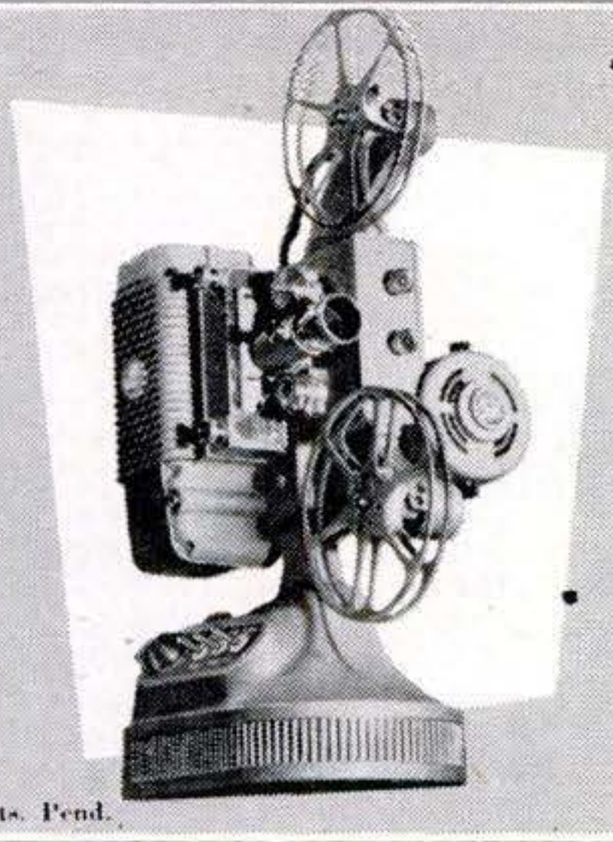
City_____ Zone____ State____

I was born on the____ day of_____ 19___

Parent or guardian_____

Name of school_____

City_____ State_____ Dept. 11



Pats. Pend.

there are hours of fun waiting for you

DeJUR

"1000"

8mm projector

Theatre-quality movies right in your own home. Yes, the DeJUR "1000" gives you professional type movies through new DeJUR features: variable speeds, reverse and still projection, 400-foot film capacity, flickerless pictures, grouped controls, cord-o-matic base. Operates on AC or DC current. Perfect for your own personal reels or library films. *$174 with case (tax incl.)*

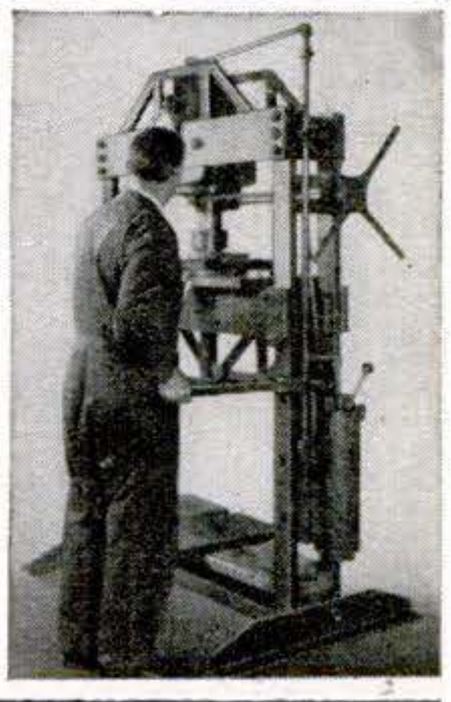
DeJUR-AMSCO CORPORATION...LONG ISLAND CITY...NEW YORK

45-01 Northern Blvd., Long Island City 1, N.Y. West Coast: 426 W. 11th St., Los Angeles, Cal.

WRITE FOR YOUR* FREE *COPY OF THE NEW

KRW HYDRAULIC PRESS BOOK

Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Arbor Presses. 32 pages illustrating the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses.
Write for your copy today.



K. R. WILSON, DEPT. 54, 215 MAIN ST., BUFFALO 3, N. Y.

Copyrighted material

CHEVRON

THE WORKSHOP SAW

PRICE **$44.95**
F.O.B PROVIDENCE
AS SHOWN
LESS MOTOR
LESS SAW

A SUPERIOR *Tilting Table Wood-Cutting* SAW

14" x 18"
CAST IRON TABLE ALL STEEL BASE

Ready NOW for your Home Workshop!

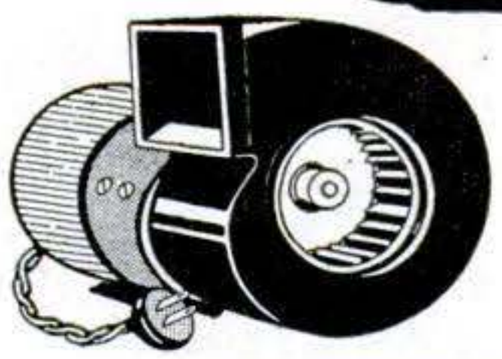
- ★ **It cuts Deeper! (app. 2-11/16" with 8" saw blade)**
- ★ **It's Sturdier, Heavier (60 lbs.) A Craftsman's Machine Tool!**
- ★ **No Die Cast Working Parts in *CHEVRON***

Adaptable for use with 1/2 H.P., 1750 R.P.M. motor, 4" pulley recommended, 2" spindle pulley furnished. • Table extensions and saws available . ask for specifications and prices. • Complete ***CHEVRON*** Specifications on Request!

ORDER NOW—WRITE DIRECT TO—

CHEVRON c/o Peerless Precision Products
387 CHARLES STREET
PROVIDENCE 4, RHODE ISLAND

EXHAUST BLOWERS $15.85



For PHOTOGRAPHERS • HOSPITALS • LABORATORIES • WORK SHOPS • LAUNDRIES • OFFICES • RESTAURANTS • PRINTERS • PLAYROOMS

100 CU. FEET FRESH AIR EVERY MINUTE!

Solve your ventilation problems with this NEW durable, built-for-service blower and exhaust. Quick and simple to install. Anyone can do it with ordinary household tools.

Continuous duty, BALL BEARING motor assures quiet, trouble free operation. Rugged housing insures long life. 110 Volt, A.C., 50-60 cycles.

Send Check, Money Order. No C.O.D.'s. West of Mississippi add $1.00 for mailing, handling.

Immediate Delivery!

UNIVERSAL YONKERS CORP.,
(Dept. S-11) 41 Locust St. Yonkers 2, N. Y.

---

41 PIECE ASSORTMENT
HAND GRINDER ACCESSORIES

Here's good news for owners of hand grinders. A 41 piece assortment of "wanted" parts and accessories for an endless variety of jobs. You'd pay well over $15.00 if you bought these parts separately.

ALL THESE PARTS ARE INCLUDED

Outfit includes 20 mounted grinding wheels with 1/8 inch shank; 10 mounted grinding wheels with 3/32 inch shank; 10 rubber and resin wheels 1x1/-8x1/8 inches—all assorted grits; and one mandrel with 1/4x1/8 inch screw.

A GUARANTEED VALUE

All parts are new—all are guaranteed. All in an attractive set-up box as illustrated. Postpaid in U.S.A. Order today.

$4.95

GROBAN SUPPLY CO.
1522 S. Michigan Ave., Dept. PS 11, Chicago 5, Ill

41 PIECES • THIS $15.00 VALUE ONLY $4.95

French Type PHONE
TS-13C Hand Set

With butterfly switch on handle. When the switch is pressed, the microphone is connected into the circuit and an additional set of contacts are closed, to operate a change over relay. Has a 6 ft. length of cord, with a PL 55 plug for earphone and PL 68 for microphone and switch. Impedance of earphone approx. 2500 Ohm; impedance of microphone approx. 250 Ohm (carbon); connected with batteries it can be used for inter-communication system. They are brand new and the original cost is many times what we are offering them to you . . . while they last.

$3.95

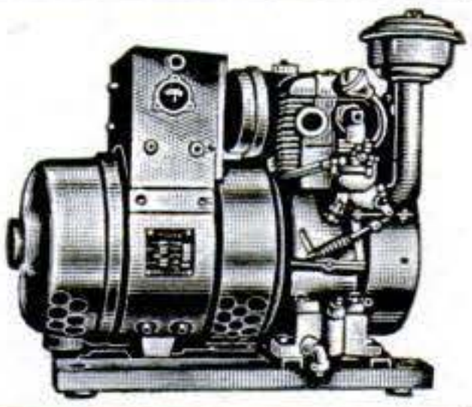
MICHAEL STAHL, Inc.
39 Vesey St., Dept. SP6 New York 7, N. Y.

Assemble KING MIDGET

Practical highway racer runabout. We supply all parts. Just bolt together. Low cost. Ready for delivery NOW. One or two cylinder 40 m.p.h., 45 to 50 on ice or snow with skiis, up to 100 miles per gallon. Send 25c for complete literature with large picture, 4-view drawings, price of parts, or send $1 (refunded with first order) for the above, plus 24-page assembly book with 42 photographs and drawings; blueprints for converting for use on ice and snow, etc.

MIDGET MOTORS Athens, Ohio

A.C. CURRENT ANYWHERE!
WITH
Katolight Plants and Generators



Furnish the same kind of Current as the highlines. Sizes 500 watts to 100 KW. Also Manufacturers of Rotary Converters, Frequency Changers, 32 and 110 Volt D.C. Motors in 1/4, 1/3, & 1/2 H.P. A.C. Motors (high line) in 1 1/2 and 2 H.P. only.

KATOLIGHT 1401 First Avenue MANKATO, MINN.

BUILD YOUR OWN *Modernistic* SPORTS TRAILER

Actual View of Trailer Assembled

Complete Pre-fabricated Kit, ready to assemble
DIRECT-FROM-FACTORY-TO-YOU — SAVES 50%

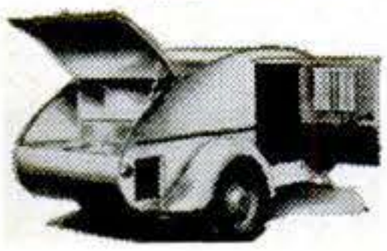
Sleeps 2 adults comfortably, roomy galley, plenty of stowage space. Lustrous all-aluminum exterior; overall length 12'7", width 6', height 5'. Total weight only 400 lbs., easy to take anywhere for delightful trips.

Eye-appealing airflow design created by aircraft engineers, with distinctive comfort features found only in most expensive custom-built jobs. **Features:** torque-type spring and SAE 1040 Steel axle; Timken high-speed bearings; Ford 16" disk wheels; tail and clearance lights that pass state laws; heavy-gauge Kaiser Aluminum thruout. Precision fitted, comes complete with all parts needed, less tires and tubes.

2 DAYS OF YOUR TIME ASSEMBLING THE MODERNISTIC SAVES YOU OVER $200.00

Easy-to-follow instructions make your assembling real fun. If factory assembled or sold to you by a dealer, this de luxe sports trailer would cost over $500.00. Factory-to-you price only $279.50, F.O.B. Los Angeles. When ordering, enclose full amount or, if you desire speedy C.O.D. shipment, send $50 deposit.

Specify COMPLETE KIT or SECTION 1, when ordering. Fit and quality of every unit unconditionally guaranteed. You'll be pleased—ORDER TODAY. **Write for free folder.**



View of Galley, Stowage Compartment and Roomy Interior

Remove Body in 10 Minutes and You Have Flat Bed Utility Trailer for Year-'Round Use

ALTERNATE CONVENIENT PURCHASE PLAN: Can be bought in 2 sections: Section 1, containing chassis and outer shell units, only $157.50; Section 2, containing balance of trailer, when you're ready for it, $139.00; deposit of $50, if ordering C.O.D. (Materials alone, without pre-fabrication, would cost you more if you bought locally.)

Modernistic
TRAILER MFG. CO.
Dept. S1, 1230 E. 109th St.
Los Angeles 2, Calif.

Copyrighted material

Gift Mart

220 POWER TELESCOPE

Explore the LAND, SEA and HEAVENS

with this super power precision built instrument. 220 diameters magnification. Equipped with 3 interchangeable eyepieces—45X erecting eyepiece for terrestrial use, with 110X and 220X eyepieces for observing the wonders of the heavens, and sturdy alt-azimuth tripod over 5 feet high.

$140
Complete

Actual photograph

Length of telescope 3½ ft. Weight with tripod 11 lbs.

Highest quality 2½" dia. achromatic lenses fluoride hard-coated for maximum brilliance. Duraluminum tubing finished in black alumilite and chromium plate. A knurled knob at the eyepiece provides easy yet accurate spiral-thread focussing.

This professional instrument built to scientific perfection and lifetime durability will provide you with a delightful and never ending source of pleasure and information. Turn the telescope toward the heavens and it will show you the moons of Jupiter, phases of Venus, rings of Saturn, double stars, hundreds of mountains and valleys on the moon, etc. At the seashore, in the mountains, on the farm, observing from an apartment house window, the back yard, or front lawn, you will be fascinated as distant people, houses, ships, airplanes, and other objects invisible to the naked eye are brought amazingly close in great detail. The price complete with all accessories is only $140. It is fully guaranteed, ready for immediate delivery, and the shipping charges are paid by us to anywhere in the United States. Order yours TODAY for immediate delivery.

BROWNSCOPE CO.

Dept. 11P 24 West 45 St. New York 19, N. Y.

TELESCOPES BINOCULARS MICROSCOPES

ARMY AIR FORCE SURPLUS

B-15 TYPE

BOMBER JACKET $10.95

BRAND NEW MERCHANDISE

For work or play. Warm . . . Comfortable, good looking. A sensational value. Extra fine grade, water repellant poplin OD. Body lined with wool alpaca. Sleeves wool lined. Genuine mouton collar. Two slit pockets. Jersey wrist and waist; zipper front. Air Corps Insignia on left sleeve. **Special $10.95.**

As above but with special added features! Two extra inside pockets . . . all four with snap fasteners; pencil pocket on left sleeve; extra warmth . . . entire jacket . . . body and sleeves fully lined with finest wool alpaca.

As illustrated **$15.95**

For either style include 25c postage—handling

1-Qt. Size
$5.95

***Famous* STANLEY SUPER-VAC**

Lifetime Vacuum Bottle

Known for years before the war as America's finest vacuum bottle and sold everywhere at $7.95. Not yet generally available at stores. Brand new, Navy surplus one-quart size. Famous unbreakable steel liner. Handsome black finish, heavy chromium plated screw top. Ideal for sportsmen, workers, campers, fishermen, etc. Good for a lifetime. A phenomenal value. Include 25c postage.

Send check or money order. Sorry no C.O.D.s. Satisfaction guaranteed or money refunded.

FREE illustrated catalog of Surplus Values

ALLIED SALES CO.

523 Mission St. Dept. SN, San Francisco 5, Calif.

Now . . .

carry all your luggage and camp equipment . . . safely, easily, conveniently . . . in the new

Tour-Top

MORE pleasant travel for particular motorists, campers, hunters, fishermen! The handsome Tour-Top looks good on your car . . . offers full protection for your equipment and more comfortable travel. Tour-Top is patented, nothing else like it. Tour-Top is water-proof, dust-proof . . . stays put and will not shift regardless of car speed or road conditions. Strongly made of heavy custom-coated canvas with heavy duty zippers and extra-strength web straps. Fastens securely. On or off in a jiffy. Easy to load and unload. Won't mar finish or interfere with doors. Thousands have been sold and used with great satisfaction all over the U. S. and Canada. Your complete satisfaction guaranteed. Order now. Immediate delivery. Use coupon below. Complete **$19.95**

Clip and Mail Coupon

Tour-Top Company:
Please ship my Tour-Top at once.
☐ Remittance of $19.95 enclosed (we pay postage)
☐ Ship C.O.D. plus delivery charge (Ohio Residents, add 60c sales tax)

Name . . . . . .

Address . . . . . .

City . . . . . .

TOUR-TOP CO. 440 Washington St. URBANA, Ohio

Bar Bells

Build Lasting Strength

For quickest, best results, use Paramount bar bells, dumb bells and the famous Paramount system. They'll give you a body packed with power and vitality. Don't wait; act today!

Factory Prices **8.95 UP**

Send today for free illustrated catalogue and price list

Save up to 30%

INDEPENDENT IRON WORKS
2416 East 23rd Street, Dept. I
Los Angeles 11, Calif.

Build a successful arc welding business quickly

with only a small investment

HOBART arc welders are "Simplified"

That's why it's easier to learn arc welding with Hobarts—to get into big profits now.

Build Your Own

With the Hobart welding generator only, used auto engine and chassis, you can "build your own" portable arc welder at home and earn bigger pay by going right to welding job.

Build Your Own Generator Only

New A. C. Heavy Duty

arc welder is just right for shop use if you start your own welding business. No job too large or small for the Hobart heavy duty A.C.

The Hobart Arc Welding School is open to everyone interested in arc welding. Learn in a hurry so you can start on a big pay welding job. Return coupon today for information. G. I. Approved.

New Industrial A. C. Welder

Hobart Bros. Co., Box P 117, Troy, Ohio

"One of the world's largest builders of arc welders"

MAIL this coupon Today!

Hobart

HOBART BROS. CO., BOX P117, TROY, OHIO

Without obligation send me information on items checked

☐ Build Your Own ☐ A. C. Welder

☐ Electric Drive Welder ☐ Hobart Trade School

PHONE NO. _____

NAME _____

ADDRESS _____

_____

GET NEW-CAR POWER!

REPLACE PISTONS YOURSELF

SAVE

40% TO 50%

With our easy-to-follow instructions you can quickly replace worn-out pistons and rings.

RESTORE POWER AND PEP
STOP OIL PUMPING AND SMOKE
SAVE ON GASOLINE AND OIL
CHECK CYLINDER WEAR

BUY "PRECISION BUILT" ALUM. ALLOY PISTONS AND RINGS

DIRECT FROM FACTORY. Constructed of finest materials they are equal to original equipment. Precision ground, heat treated for long-wearing qualities, carefully tested.

		Each	With Rings
FORD V8-85-F.H. 32-42	3 Ring	$1.60	$2.50
	4 Ring	1.80	2.80
D.H. 32-42	3 Ring	1.70	2.60
	4 Ring	1.90	2.90
CHEVROLET 29-36		2.50	3.60
37-46		2.70	3.80
PLYMOUTH 32-46		3.00	4.00
DODGE 34-42		3.10	4.15
OLDSMOBILE 35-36		3.20	4.50
PONTIAC 37-40		3.00	4.00

All pistons include pins (at no extra cost)

Give *make, year, model, engine number, serial number,* and *number of cylinders.* We will refund your money if you are not completely satisfied with the factory-to-you low price, within 10 days of receipt. Merely enclose $2 in cash, check or money order with order, and pay balance C.O.D. plus postage when speedy shipment arrives. Fully guaranteed. *ORDER TODAY.*

PRECISION BUILT PISTONS

610 So. Grand Ave. • Pasadena, California

LABORATORY MICROSCOPE

600 POWER $22.50

3 Objectives—75X, 300X, 600X

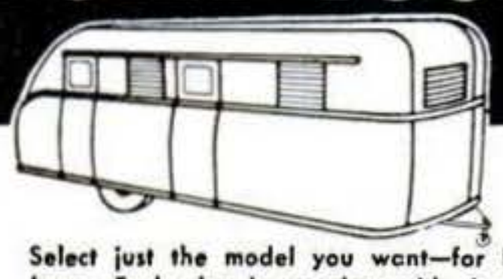
A professional type microscope priced within the reach of the amateur. For school, laboratory, physician, and student. Color corrected achromatic lenses. Professional size eyepiece and objective interchangeable with all standard professional makes. Height 14 inches. Weight 5¼ lbs. Stage 4"x4". 2 wheel focusing. Body tilts any angle. Microscope complete with 3 objectives, prepared specimen slide, and 96 page book on microscopy, only $22.50.

We pay the postage. Immediate delivery. Money back guarantee.

BROWNSCOPE CO.

Dept. 11P, 24 West 45th St., New York 19, N. Y.

BUILD YOUR OWN TRAILER



Get these Modern Complete Plans

Select just the model you want—for hunting—travel—camping—or as a home. Each plan is complete with simple, step-by-step instructions and a bill of materials. Easy to follow. Three models!

STOCK No. H27 NATIONAL MODEL 27. A sleek 27-foot trailer with 3 rooms, lavatory, etc. Sleeps six. complete plan **$1.00**

STOCK No. H20 NATIONAL MODEL 20. A good-looking, easily-built 20-ft. trailer. 3 rooms, sleeps four. complete plan **$1.00**

STOCK No. H10 NATIONAL CAMPER. A compact unit for traveling, camping, hunting, fishing. Sleeps two. Complete plan **.50**

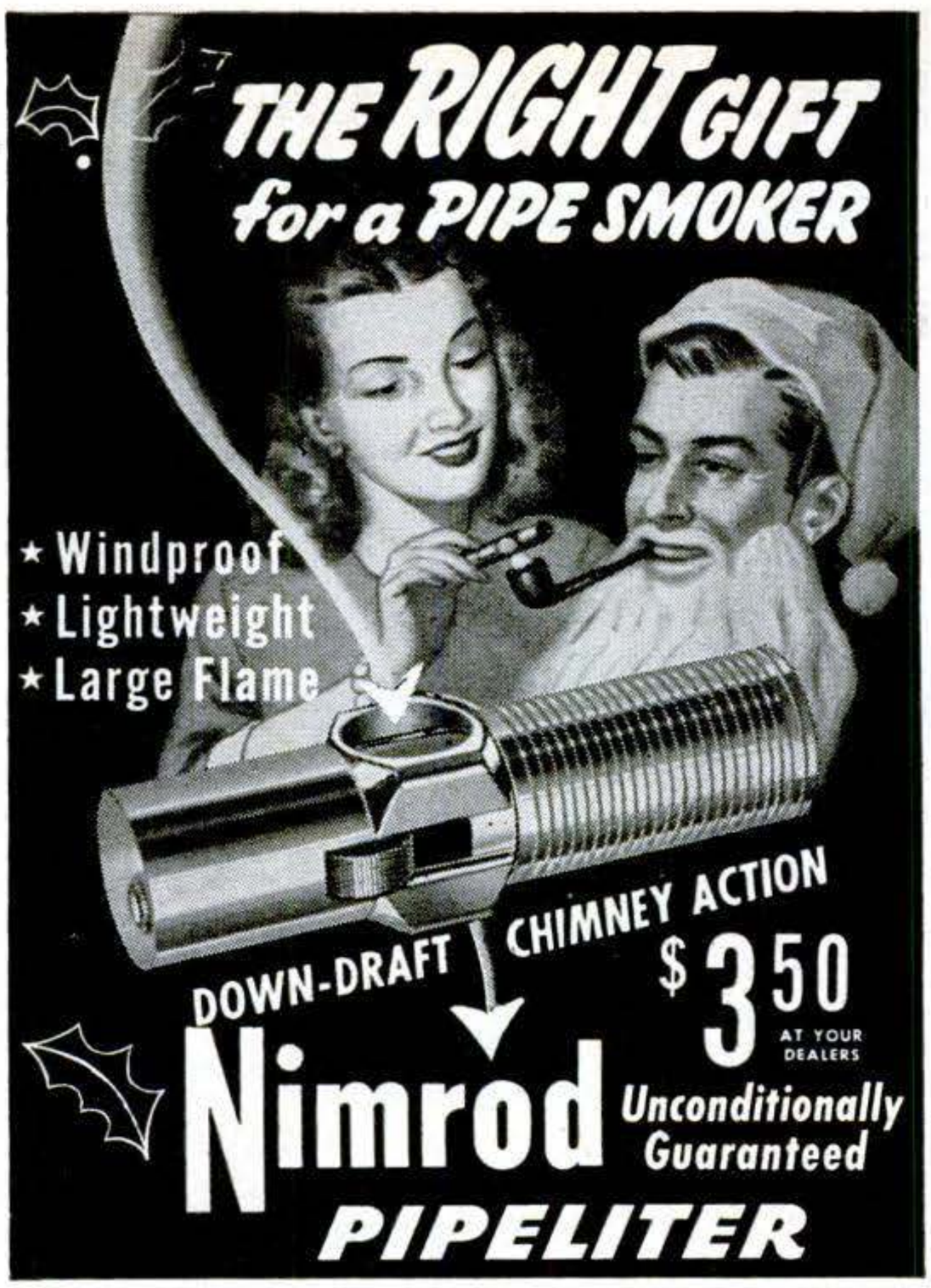
Special—Order all 3 of above plans.....$2.00

FREE! *Big parts catalog with any order*

NATIONAL TRAILER STORES

Dept 9 Box 2353 Terminal Annex — Los Angeles 54, Calif.

Copyrighted material



If your dealer is unable to supply you send **$3.50** direct

WARD-NIMROD COMPANY
Dept. 36-G, 2968 Jessamine St., Cinti. 25, Ohio

Do your own professional

FELT FLOCK FINISHING

with complete spray outfit

Now you can apply a professional, colorful, felt flock finish on hobby crafts, novelties, art objects, lamps, furniture, toys, etc. Velvety, durable, easy-to-apply finish. Available in 10 brilliant colors. Complete outfit (as pictured) includes undercoat, brown and ivory flock, solvent, brush, patented spray gun and instructions. Complete price $9.25 post paid. Write for FREE circular and color sample card.

BEROTT-ROSS • Dept. 11-B 411 No. Foothill Road, Beverly Hills, Calif.

ONE-MAN SAWMILL LESS THAN $200.00

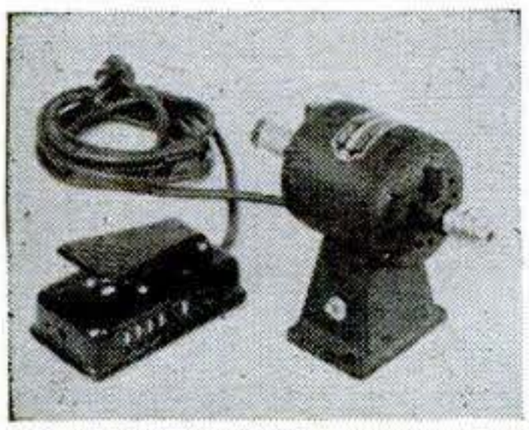
Easy To Turn Trees Into Money

Makes Lumber ties, shingles, crates, lath, studding, siding.

BELSAW MODELS in 10 to 24 foot sawing lengths. **MECHANICAL FEED,** accurate set works and positive dogs. Use tractor or old auto engine for low cost power. Thousands used for commercial sawing. Pays for itself quickly. Send post card today for FREE booklet, "How To Make Lumber" and Catalog of Woodworking Equipment.

BELSAW MACHINERY COMPANY
2846D Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

LATHE MOTOR



The perfect gift for the model builder or hobbyist. Rugged—versatile—precision made. Used for years for precision work. Made by Racine Universal Motor Co. Universal AC-DC. 1/12 H.P. 13,000 RPM. Equipped with Allen-Bradley rheostat. Reversible switch. 3 step pulley. Arbor for grinding or buffing wheel. Ideal for detailed grinding and use as a small power unit. Orders filled immediately. $30 complete. Add $5 if chrome finish desired. Without speed control rheostat deduct $4.75.

Send check, money order, or COD request to:

Pen-Mar Distributors **Dublin, Pennsylvania**

THE FIRST TOOL OF THIS KIND—TODAY'S FINEST!

Smooth, steady power at your fingertips! Perform precision operations not possible with any other portable tool! With a Handee you can turn out professional looking projects for pleasure or profit—ship, plane and train models, delicate, internally carved costume jewelry, wood carvings, puppets, initialed tumblers, etc. AC or DC. 25,000 r.p.m. Wt. 12 oz. Over 500 accessories made especially for the Handee!

A GOOD START—THE HANDEE KIT

HANDEE Tool and 40 most popular accessories packed in compact steel carrying case. You'll be amazed at what you can accomplish! At stores or postpaid **$27.50**

Handee only, with 7 accessories, $20.50

FOR YOURSELF OR A FRIEND... THE GIFT OF A LIFETIME!

NEW PLASTIC-CRAFT KIT

For internal carving. Contains special plastic cutters, buffers, sanding discs, buffing compounds, a liberal supply of clear plastic, dyes, cement and instructions. At stores or postpaid **$6.95**

GET A HANDEE at stores everywhere. If they can't supply you we'll send it postpaid. Satisfaction guaranteed. Free 52-page Manual on request.

CHICAGO WHEEL & MFG. CO.
1101 W. Monroe St. Dept. PO, Chicago 7, Ill.

Send ☐ Handee Kit ☐ Handee Tool ☐ Plastic-Craft Kit
☐ C.O.D. ☐ Remittance enclosed ☐ Send Manual

Name.....

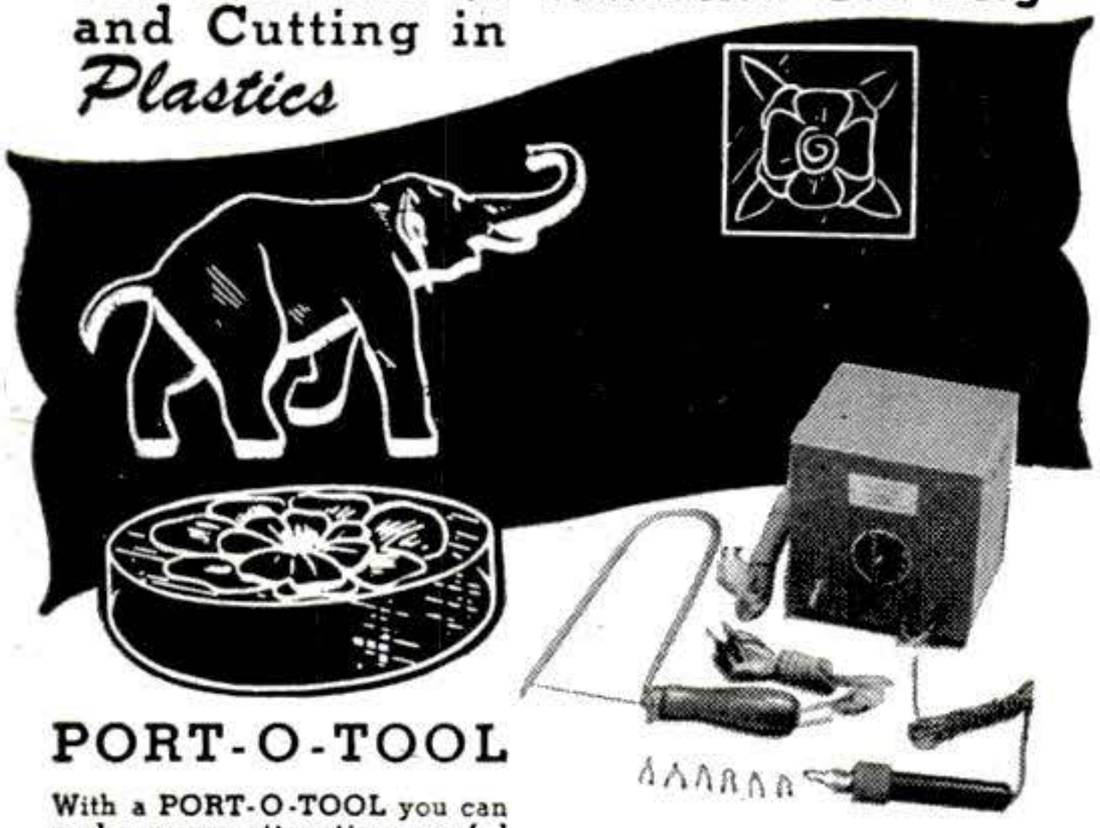
Address.....

.....

Copyrighted material

Amazing New Tool—

For Internal or External Carving and Cutting in *Plastics*



PORT-O-TOOL

With a PORT-O-TOOL you can **make many attractive, useful articles from plastics: earrings, pendants, brooches, buttons, decorative plaques...and many other items.**

PORT-O-TOOL will also do a variety of things such as engraving—stamping—embossing—welding—heat sealing—soldering — etching — wood burning and sawing on plastics, wood, leather and metal.

PORT-O-TOOL is easy to operate — anyone can learn to use this tool in less than an hour. No skill is required.

PORT-O-TOOL is a natural for hobbyists, home craftsmen or for commercial use. Manufactured in two sizes: Master Model, large heavy duty, $22.50...Junior Model, small, compact, $15.75.

Buy PORT-O-TOOL from your dealer today. If he can't supply you order direct. Here are a few dealers who stock PORT-O-TOOL:

PALACE HARDWARE CO. . . . 581 Market Street . . . San Francisco, California
PALACE HARDWARE CO. . . . . Lakeside Village . . . . San Francisco, California
PLASTIC PRODUCTS CO. . . . 371 South Main Street . . . Salt Lake City, Utah
PLASTIC MART . . . . . 2443 East 14th Street . . . . . Oakland, California
PLASTIC PARTS AND SALES . . . 1157 South Kingshighway, St. Louis, Missouri
THE MAY COMPANY STORES . . . . . Los Angeles, California
POLKS MODEL CRAFT HOBBIES, 225 South Wabash Avenue, Chicago, Illinois
POLKS MODEL CRAFT HOBBIES, 314 Fifth Avenue, New York City, New York
ALLISON ERWIN COMPANY, 216 East 6th Street, Charlotte, North Carolina

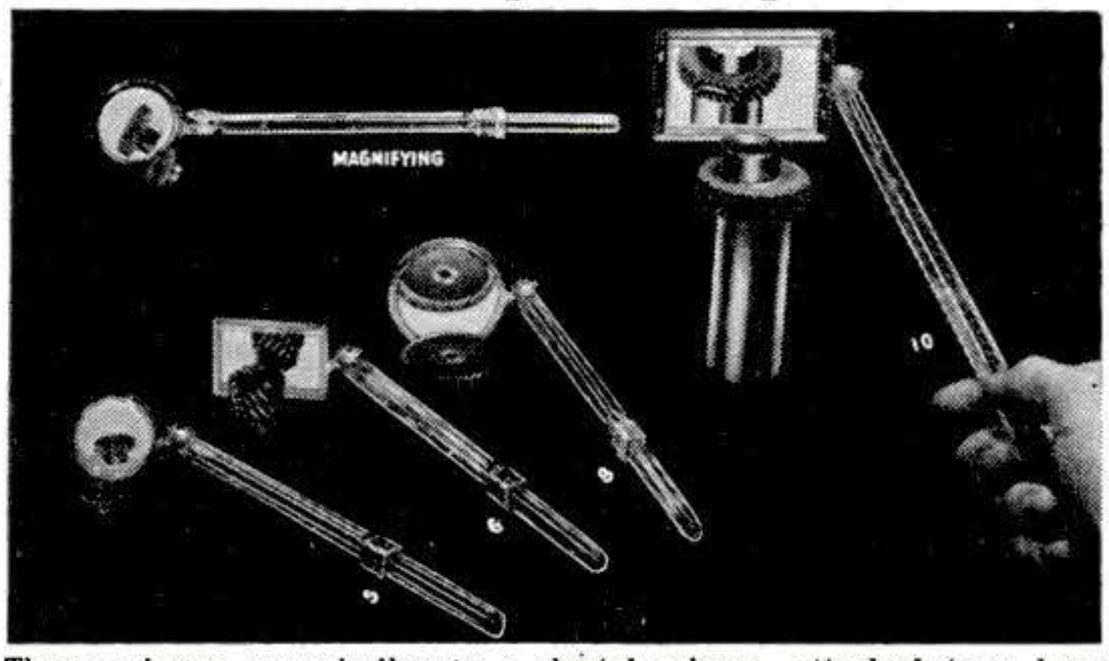
See the PORT-O-TOOL display at
National Hobby Crafts and Science Show — New York City — November 23 to 30

We also carry a complete line of plastic supplies and materials for the plastic-craft hobbyist. Send for free catalog.

BARNETT SPECIALTY CO. 5104 HOLLYWOOD BLVD. HOLLYWOOD 27, CALIF.

NEW INSPECTION TOOL

Gets into impossible places!



These mirrors are similar to a dental mirror, attached to a long plastic handle, adjustable by the touch of your thumb to any angle within an arc of 45 degrees. (Note sleeve on handle). Enables you to clearly see behind gears, into a tank, inside the angle of a pipe, inside a casting, underneath a fitting, around a corner; in fact, this adjustable mirror enables you to see the back, bottom, side or top of just about any part that is hidden from straight vision. Strong plastic, transparent handle. Mirror mounted in a plastic frame with back fully covered for strength and durability. Every mechanic should have a set. You may purchase one or more sets each set consisting of 1 No. 5—70c, 1 No. 6—80c, 1 No. 8—90c, 1 No. 10—$1.75, 1 magnifying $1.25 at $5.40 per set, or you may purchase a **minimum** quantity of six mirrors any selection at above list prices, delivered. Check or Money Order. No C.O.D. Write for quantity discounts.

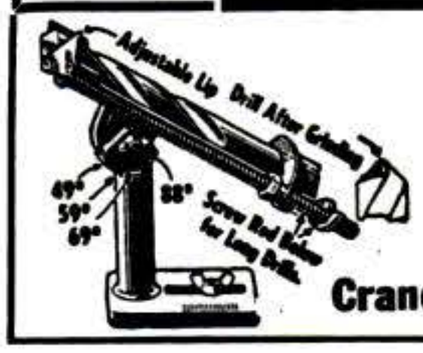
F. P. KRETCHMER
3535 Hughes **Los Angeles 34, Cal.**

OWN A Printing Business

Cards, Tickets, Stationery, etc. Good profit in spare time. **PRINT YOUR OWN** greeting cards, movie titles, church work, etc. Save money. Easy rules supplied. Raised printing like engraving too. Have home shop. Sold direct from factory only. Send dime for supply book, suggested outfits, all details and advice on your needs. No obligation. **KELSEY, INC. C-33, MERIDEN, CONN.**

NONE BETTER!

SUPER DRILL GRINDER



Sharpens round shank drills from 3/32" to 1 1/16" in diameter, up to 11" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only $2.95
At Dealers or Postpaid

Crandall Mfg. Co. 1512 W. Slauson, Dept. FB-23 Los Angeles 44, Calif.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction —over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. G.I. Approved. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 83-S, 646 N. Michigan Ave., Chicago 11, Ill.

BROKEN JEWELRY WANTED

All kinds. Highest prices paid for jewelry, rings, spectacles, gold teeth, diamonds, broken and usable watches, etc. Cash mailed promptly. Write for FREE shipping container.

LOWE'S, Dept. PS, Holland Bldg., St. Louis 1, Missouri

Authenticast SCALE MODELS OF TANKS AND SOLDIERS!

GI's with bazookas, tommy guns, rifles — machine gunners, anti-tank crews behind the famous M12 — 155mm "Long Tom"

PERFECTLY CAST—ALL METAL

AUTHENTICAST scale models are scoring a direct hit with hobbyists everywhere! Ask your hobby dealer to show you the complete AUTHENTICAST collection of tanks, jeeps, scout cars, half tracks and soldiers. Tanks $1.10 to $2; Men $1.85 box of 12 asst'd. Scaled to match, 1 in. to 9 ft. Send 35c in coin for 32-page color catalog.

Authenticast
COMET METAL PRODUCTS CO. INC.

132-01 91st Ave., Richmond Hill 18, N. Y.

Copyrighted material

When you want to fix things fast . . . remember Weldwood Glue. It's quick to mix . . . easy to use . . . tremendously strong . . . stain-free . . . rot-proof . . . and permanent. At hardware stores, lumber yards, chain stores, in 10¢, 25¢, 50¢, 85¢ and larger sizes.

WELDWOOD
PLASTIC RESIN
WATERPROOF GLUE

United States Plywood Corporation, New York 18, N. Y.

MAGIC LIQUID MAKES
PHOTOS APPEAR

Amazing discovery permits you to print pictures from any of your snapshot negatives on wood, cloth, leather or paper. Like magic your pictures will show on ties, handkerchiefs, purses, Christmas cards and letterheads. Takes only a few minutes in broad daylight. Won't rub off or harm negative. An attractive set with enough material for over 100 pictures. ORDER TODAY. Send $1.00 postpaid. C.O.D. pay postman a few cents more in addition. (Foreign $1.50 money order only.)

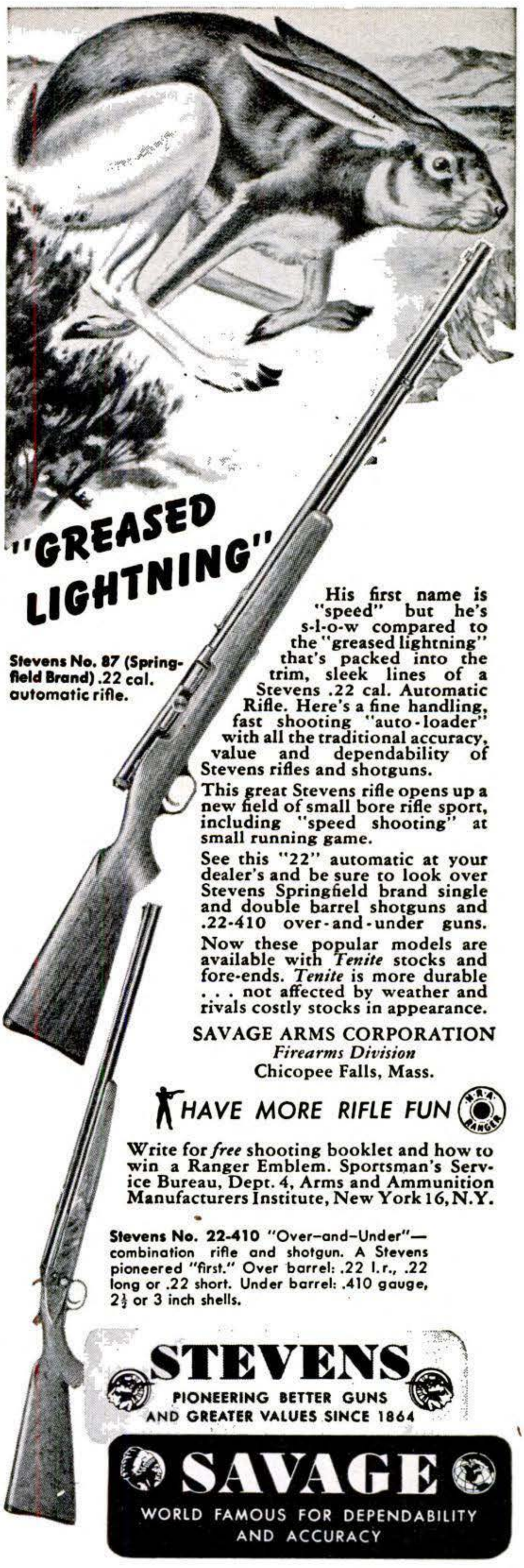
STYLE-ARTS, Inc., Dept. PS-10, 2427 Cortland, Chicago 47, Ill.

FINE TOOLS *NEED* FINE OIL!

• Lubricates
• Prevents Rust
• Cleans • Polishes

SOLD EVERYWHERE

3-IN-ONE *Oil*



"GREASED LIGHTNING"

Stevens No. 87 (Springfield Brand) .22 cal. automatic rifle.

His first name is "speed" but he's s-l-o-w compared to the "greased lightning" that's packed into the trim, sleek lines of a Stevens .22 cal. Automatic Rifle. Here's a fine handling, fast shooting "auto-loader" with all the traditional accuracy, value and dependability of Stevens rifles and shotguns.

This great Stevens rifle opens up a new field of small bore rifle sport, including "speed shooting" at small running game.

See this "22" automatic at your dealer's and be sure to look over Stevens Springfield brand single and double barrel shotguns and .22-410 over-and-under guns.

Now these popular models are available with *Tenite* stocks and fore-ends. *Tenite* is more durable . . . not affected by weather and rivals costly stocks in appearance.

SAVAGE ARMS CORPORATION
Firearms Division
Chicopee Falls, Mass.

HAVE MORE RIFLE FUN N.R.A. RANGER

Write for *free* shooting booklet and how to win a Ranger Emblem. Sportsman's Service Bureau, Dept. 4, Arms and Ammunition Manufacturers Institute, New York 16, N.Y.

Stevens No. 22-410 "Over-and-Under"—combination rifle and shotgun. A Stevens pioneered "first." Over barrel: .22 l.r., .22 long or .22 short. Under barrel: .410 gauge, 2½ or 3 inch shells.

STEVENS
PIONEERING BETTER GUNS
AND GREATER VALUES SINCE 1864

SAVAGE
WORLD FAMOUS FOR DEPENDABILITY AND ACCURACY

Copyrighted material

Announcing-

WORLD'S BEST HAND TOOL!

New

THIN-NOSE VISE-GRIP with **WIRE-CUTTER**

Possesses all the features of the world-famed VISE-GRIP Toggle Wrench including Ton Grip, plus:

THIN TAPERED NOSE Reaches down into extremely tight places to grip bolt-heads, screw-heads, rod-ends, etc.

NEW INVOLUTE JAW CURVE New scientific design puts tremendous pressure on 4 points of any size nut. Increases tooth-contact on round work—work can't slip out of jaws. Holds round work up to 1⅞" diameter. Holds anything, any shape, with a non-slip grip.

WIRE CUTTER Ton-pressure cuts wire and small bolts. Actually cuts ¼" bolts by taking progressive bites.

KNURLED JAW TIPS Holds work at the very tip with powerful non-slip grip.

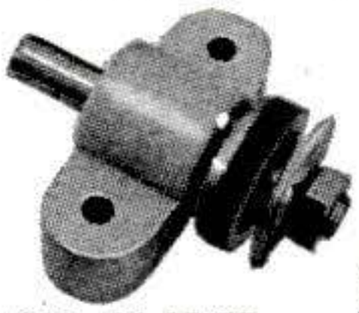
Never before was so much usefulness packed into a single hand tool! Easy to open from locked position. Made of fine alloy steel. Nickel plated. 2 sizes: 7" and 10"—both with or without wire-cutter.

SEE YOUR DEALER! If he hasn't it, order direct. With Cutter, 7", $2.25, 10", $2.50. Without Cutter, 7", $1.85, 10", $2.25. Get yours at once.

Petersen Mfg. Co., Dept. 37 DeWitt, Nebr.

BUILD YOUR POWER TOOLS

WITH OUR BALL BEARING ARBORS



New Departure Self Lubricating Bearings **10,000 rpm**

C5-⅝ pictured

B33—$4.95 PP
⅝x4½ Spindle
B15 Plain Spindle $3.45

(No extra charge for left hand threads)
C4-½x12½ Spindle, Housing 2x8 $8.25 PP.
C5-⅝x12½ spindle, housing 2x8 $8.25 PP.
C6-¾x12½ spindle, housing 2¼x8 $9.25 PP.
D8-1x17½ spindle, housing 2⅝x11 $16.95 PP.
1 INCH BETWEEN WASHER AND COLLAR

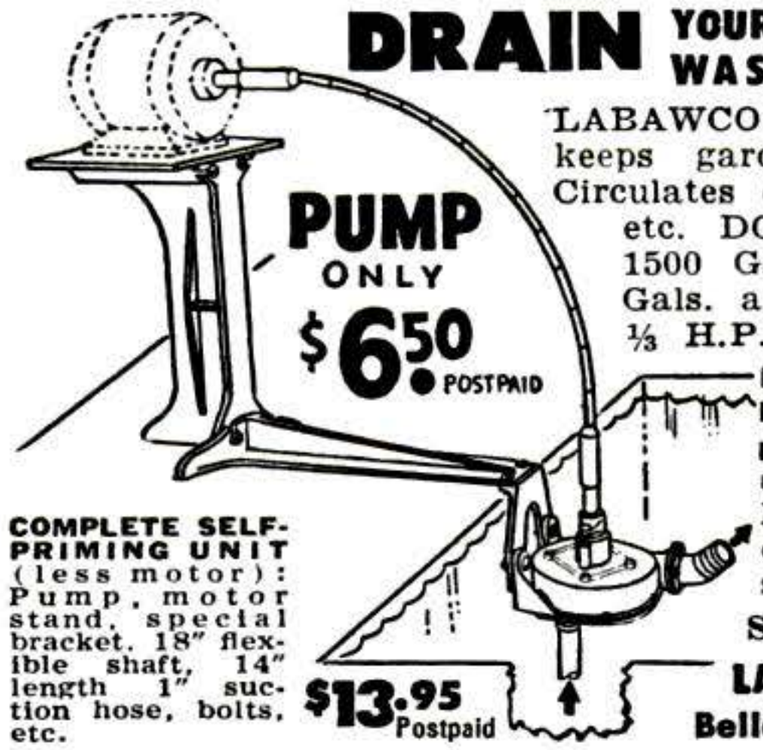
SPECIAL SAW ARBORS with 4 in., 5 in., 6 in., 7 in., housing length, add $1.40, ½, ⅝, ¾ models. Ask about other designs. (30 day delivery). P.P.

Shaper Arbors, C4, C5, C6 or D8, 3 inches between collars, add $6.00. Plain Spindle Models less threads and collars C4—$8.00, C5—$8.00, C6—$9.00, D8—$16.00. All P.P.

SANDING DISCS, 8"—$3.50 PP., 10"—$5.00 PP. Center Hole ½, ⅝ or ¾. State hole size.

POLY PRODUCTS, 406 S. Chester, Ct. 1b, Pasadena 5, Calif.

DRAIN YOUR CELLAR, POOL, WASH TRAYS, ETC.



PUMP ONLY $6.50 POSTPAID

LABAWCO Type P Pump keeps garden pools fresh. Circulates oil or refrigerant etc. DOES NOT CLOG! 1500 Gals. per hr.—300 Gals. at 30'. Uses ⅛ to ⅓ H.P. motor.

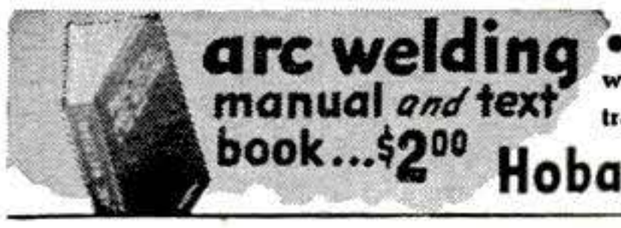
Pump alone $6.50. Pump with complete self-priming unit $13.95. POSTPAID if cash with order. West of Mississippi, add 50c.

COMPLETE SELF-PRIMING UNIT (less motor): Pump, motor stand, special bracket, 18" flexible shaft, 14" length 1" suction hose, bolts, etc.

$13.95 Postpaid

Send Order Today

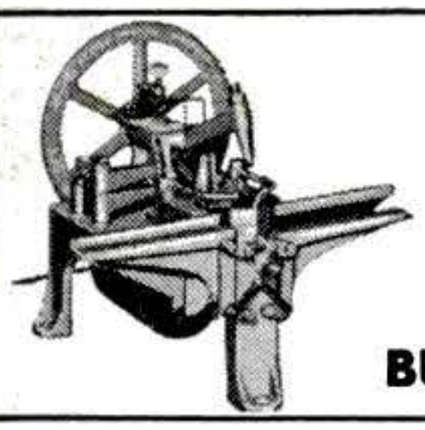
LABAWCO Pumps
Belle Mead 3, N. J.



arc welding manual *and* text book...$2.00

• Teaches you how to become an arc welding operator – one of highest paid trades today. Write today!

Hobart Bros. Co., Box P-562 Troy, Ohio



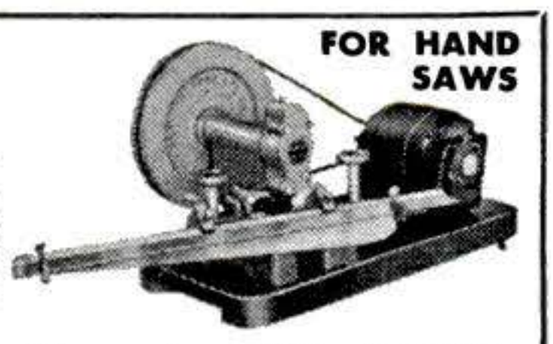
AUTOMATIC SAW SET

Set saw teeth automatically on hand or band saws—400 per minute without effort. Perfect hammer and anvil action sets teeth uniformly—No tooth breakage.

★ **IMMEDIATE DELIVERY WRITE TODAY**

AUTOMATIC RETOOTHER

Cuts new saw teeth in 50 seconds—any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job.



FOR HAND SAWS

BURR MFG. COMPANY, 8931-K Venice Blvd., Los Angeles 34, Calif.

BUY Fender Repairs BY THE CAN!

You can fix fender dents and body bumps at home—with MAGIC PLASTIC BODY SOLDER. Works like putty, dries steel hard in a jiffy. Will fill holes, dents, cracks and rust spots. Can be sanded and painted when dry.

Magic Iron Cement Company

1366 EAST 34th ST., CLEVELAND 14, OHIO

SEND **$1**
For Generous ½ Lb. Can
MONEY BACK GUARANTEE

Copyrighted material

WORLD'S BIGGEST, MOST POWERFUL, SAFEST

MAGNETIC JIG SAW

READY for Christmas Delivery!

NUMBER 2000

SYNCRO

For Hobbyists
Craftsmen, Light Production
GREATEST CLEARANCE, LARGEST TABLE TOP OF ANY MAGNETIC SAW MADE!

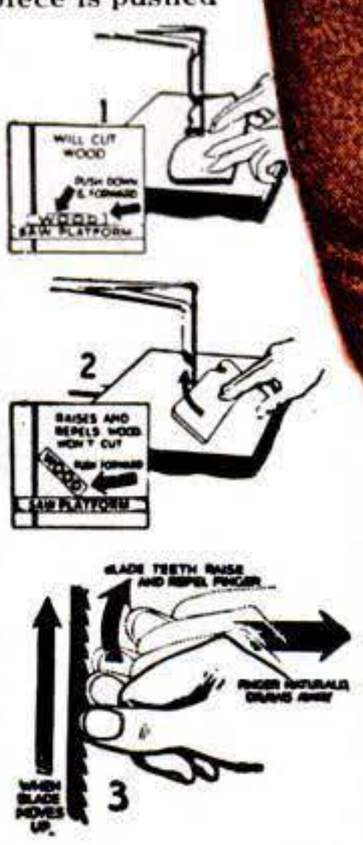
ONLY $17.50
FOB FACTORY
Shpg. Wt., 18 Lbs.
Slightly higher in foreign countries.

NO MOTOR NEEDED . . JUST PLUG IN!
PORTABLE! SAFE! CUTS CLEAN!

HERE'S the perfect, lasting family Christmas gift to get or give . . SYNCRO . . the remarkable, safe, patented magnetic jig saw . . ready for immediate shipment! SYNCRO needs no belt, no gears, no oiling. No motor to buy. Just plug in any 50 or 60 cycle (A.C. only) 110-120 volt wall outlet—in kitchen, attic, basement—set on kitchen table, floor, anywhere—and saw! The high-speed, short Magnetic Safety Stroke Action, and freedom from belts, makes SYNCRO so **safe** small boys and girls may use it. Cuts intricate designs on 5/8" soft wood, 1/2" medium hard plywood and thinner hardwoods, plastics, thin metals. Leaves no ragged undersides on plywood, cardboard. Cuts to center of 27" circle! Get, enjoy this safe, educational, practical quality tool for making models, displays, puzzles, inlays, silhouettes, toys, whatnots, etc. Limited supply—so hurry!

WHY SYNCRO IS SAFEST!

SYNCRO has NO continuous cutting blade nor "Long stroke" blade to pull fingers into teeth—instead there are 14,400 strokes per minute—7,200 short cutting strokes plus 7,200 upward NON-CUTTING, REPELLING strokes! (Fig. 1) SYNCRO will not even CUT wood unless piece is pushed FIRMLY DOWNWARD AGAINST blade and FIRMLY FORWARD—both actions at SAME time! SYNCRO blade teeth cut ONLY on DOWN stroke. (Fig. 2) Teeth raise, repel, push away any object on "UP" stroke. (Fig. 3) When blade moves UP it KICKS finger away free! On down stroke blade does not move far enough to accidently cut finger unless finger is intentionally, deliberately fed into blade like wood is fed in Figure 1. No wonder SYNCRO is the world's SAFEST saw . . . a feature old and young users acclaim!



"Family Saw"

"The SYNCRO POWER SAW ordered from you in 1940 is still sawing merrily away. My son (then 8) has used it in attic, kitchen, his room, and basement shop, I use it too. We never worry about accidents due to its MAGNETIC SAFETY STROKE feature. It's truly a family saw."—Mr. B. H. Smith, Rexburg, Idaho.

Complete with Cord, 3 Blades

ORDER NOW ON 10 DAYS TRIAL!

Order with **complete confidence** on **this** liberal Trial Offer: When you get your SYNCRO, plug it in and saw, as per directions. Then, if it does now saw **cleaner, better** than any other jig saw you ever used, and with more safety . . . if it does not satisfy YOU . . . return it undamaged, postpaid and post-marked within 10 days of its delivery date . . . and we will refund the saw price promptly without question!

15 OUTSTANDING SYNCRO FEATURES:

(1) World's safest saw. **(2)** Portable. **(3)** No rotating motor needed as self-contained magnetic power unit transmits A. C. magnetic impulses to armature diaphragm—power transferred to blade. **(4)** No rotating parts to wear out. **(5)** 14,400 magnetic strokes per minute. **(6)** Never needs oiling. **(7)** Large 10" x 10" table top. **(8)** Cross section engraved lines on top. **(9)** Big 13 1/2" throat clearance. **(10)** Finest steel blades. **(11)** Rubber feet. **(12)** 5' cable, plug. **(13)** Varying voltage adjustment nut. **(14)** Lifetime durability. **(15)** Quality materials, workmanship, performance . . . guaranteed by the famous "SYNCRO" trademark name.

SEE YOUR DEALER FIRST!

SYNCRO SAW CORPORATION
Dept. B-117, Rochester, Michigan
Export Address: 120 Wall St., N.Y.C.

Gentlemen: Here's my order for one SYNCRO MAGNETIC JIG SAW, Model No. 2000, shpg. wt. packed, 18 lbs. $17.50 FOB Factory. Please send it complete with electric cable and plug, 3 blades, on your 10 Days Money Back Trial Offer. I enclose $17.50 as payment.
Please ship saw:
( ) Express charges collect or ( ) Parcel Post charges collect
( ) Express, for which I enclose an extra $.....
( ) Parcel Post, for which I enclose an extra $.....
NAME.....
St. & No.....
CITY.....STATE.....
( ) I enclose no money—send FREE SYNCRO CIRCULAR

SYNCRO SAW CORPORATION
Dept. B-117, Rochester, Michigan
Export Address: 120 Wall St., N.Y.C.

WORLD'S LARGEST MAKERS OF ELECTRIC JIG SAWS

Copyrighted material

WORLD'S LOWEST PRICED ADDING MACHINE

VEST POCKET SIZE

NEW!

Fits vest pocket or purse. Guaranteed accurate. Operated as easily, and as reliable, as machines costing many times as much. NOT A TOY OR GADGET. Precision made—very durable. Guaranteed for life against defects in construction. Beautiful looking, modernized design. Finished in silver with black numbers and red slides. You positively can't buy a Calculator of equal quality for as little money. ACCEPTED AS THE FINEST LOW PRICED CALCULATOR FOR OVER 35 YEARS! Now completely redesigned and improved. **BETTER THAN EVER BEFORE!** Operates with a flick of your finger. Adds, subtracts, multiplies, divides—counts up to one billion. Pays for itself over and over in mistakes avoided and time saved.

MAKES IDEAL GIFT

Baby Calculator makes an ideal gift—for every Gift occasion. Birthday — Graduation — Christmas — Anniversaries. For men, women, children, teachers, business people, home or shop use. **COMES PACKED READY FOR GIFT WRAPPING.**

TEN DAY TRIAL

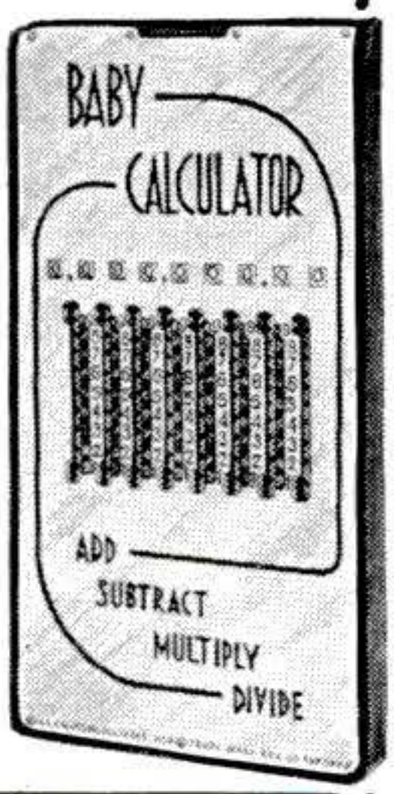
Money Back Guarantee

Because we know that our machine is the very best Calculator to be obtained at this low price, we make this 10 Day Trial Offer on a positive money back guarantee! Don't buy ANY Calculator without this guarantee! Send only name and address, pay postman $2.95 plus postage (if cash is sent, we pay postage—you save up to 40c). (Send full cash if outside U. S.) Money back within 10 days if not delighted.

FREE TRIAL

ONLY **$2.95** TOTAL COST

SEND NO MONEY



AGENTS WANTED

FREE!!

Each Baby Calculator enclosed in beautiful, rich-looking simulated Leather Case—at no extra cost.

CALCULATOR MACHINE CO. (Mfrs.)
Dept. 484, P. O. Box 248, GLENVIEW, ILL.

USE COUPON

CALCULATOR MACHINE CO., (Mfrs.)
Dept. 484, P. O. Box 248, Glenview, Ill.
Your Calculator is just what I've been looking for. Send one at once (C.O.D.) or (I am enclosing $2.95).

Name.....

Address.....

City.....State.....

NOW YOU CAN PAINT WITH PLASTICS

The brilliant glistening beauty of pure phenolic plastics is now yours for as large a surface as you want, at an infinitesimal fraction of the cost of solid plastics. A block of the cheapest wood or other material can be made as beautiful, as durable, as chemical-proof, as brilliantly polished, as a block of pure plastic, for **PHENOPLAST** is nothing but 100% phenolic resin which due to new scientific compounding methods, can now be made to actually "set" or "polymerize" **ON YOUR WORK,** instead of requiring huge ovens or gigantic molding-presses. **ALL THE ADVANTAGES OF SOLID PLASTICS ARE RETAINED** —yet you just **BRUSH IT ON, WIPE IT ON, SPRAY** it, or **DIP** it —and you have an object that looks, feels, shines, lasts and acts like solid plastic. You can turn burlap or cotton batting into strong shockproof automobile bodies, you can carve small objects in pine and make them look like ruby or jade, you can put down a floor finish that never needs waxing, you can paint a boat-hull that resists fungi, teredos and barnacles and cannot peel, you can turn linoleum into "tile," you can put a permanent finish, with a permanent polish, on **ANYTHING** with **PHENOPLAST**—it sets with the highest gloss and the hardest surface of **ANY** finish. Apply a coat of **PHENOPLAST** now used in Large New York Hotels.

PHENOPLAST the new cold-setting liquid phenolic resin was developed by A. J. Lockrey, plastics expert and author of "PLASTICS," the text book used in most vocational schools.

SEND FOR TRIAL PACKAGE—a quart of clear transparent PHENOPLAST, three bottles of ruby, jade and amber dyes and complete instructions for dozens of fascinating uses, only..... **$3.95**
Per gallon, without dyes, **$12.00** FOB. N. Y.

LOCKREY PLASTIC PRODUCTS CO.
40-16 150th St. **Flushing 3, N. Y.**

BE COMFORTABLE !

Folding Sponge Rubber Cushion protects you against hard, damp seats at sports events. Ideal for office, workshop, on trips. Send Check or Money Order; $1 for Standard size, 7 x 13-1/4 x 5/8" (Fits Coat Pocket) or $2 for Deluxe, (9 x 16 x 3/4"). Postpaid.

SIDNEY SMITH INTERNATIONAL
1112 Wilshire Blvd. Los Angeles 14, California

---

151 Piece ASSORTMENT HAND GRINDER Access.

A bonanza of valuable parts and accessories for owners of hand grinders! Everything you could want is included in this great lifetime assortment.

GREATEST GRINDER ASS'T. EVER OFFERED

Just look what you get: 1 roughing stone; 8 mounted stones with 1/8 inch shank; 2 buffers; 6 cut-off wheels; 1 circular saw; 2 rubber abrasive wheels; 100 abrasive paper discs; 3 felt wheels; 1 felt cone; 3 mtd. bristle brushes; 2 mtd. stones; 1 mtd. wire brush; 1 mtd. drum sander; 6 sander sleeves; 7 steel cutters; all with 1/8 or 3/32 in. shank; 7 mandrels with 1/8 in. shaft, 1/16" screw. Everything you could want is there.

$8.95

ALL NEW — GUARANTEED

Every piece in this great assortment is new—it gives you the right tool for every job. All in an attractive setup box handy to keep on the work bench. Postpaid in U.S.A. Order today!

GROBAN SUPPLY CO. 1522 So. Michigan Ave. Dept. PS 11, CHICAGO 5

A Home Workshop

AT BARGAIN PRICE

Accurate and precise 2 speed guaranteed hobby lathe, the essential machine for the home workshop, sturdy enough for light production work or factory standby service. Supplied with 56 inches of belting for connecting to any available electric motor or power take-off, such as on a jeep or tractor. Also included in this unbelieveable offer, are such accessories as a one-half inch drill chuck with specially hardened tool steel jaws, a four inch electric furnace, high speed grinding wheel, a cotton buffing wheel with a large supply of buffing compound and a steel wire scratch brush. Distributor inquiries invited. Special at $6.00, postage prepaid.

BUFFALO RADIO SUPPLY
(Sole Export Agents)
219 GENESEE, BUFFALO 3, NEW YORK

Copyrighted material

AN IDEAL AND PRACTICAL GIFT FOR ANY MAN

Now a DYNAMIC Industrial Transformer Type Super Charged WELDER

FOR ONLY **$28.50** COMPLETE

Do Your Own Welding

Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop . . . Make money doing repair work for others.

Write Today for Particulars

GET DETAILS on our 10 day Trial Offer.

Member Chicago Association of Commerce.

For AUTO, HOME APPLIANCE and FARM REPAIRS!

DESIGNED TO DO HIGH GRADE WELDING INEXPENSIVELY—Maintenance Men, Farmers, Mechanics, Machine Shops, Foundries, Auto, General Repair and Job Welding Shops, all using the DYNAMIC find it so indispensable and useful that they can't afford to be without it. **EASY-TO-OPERATE.** If inexperienced you can easily learn to do a variety of high grade welding jobs by following the practical, *simplified* WELDING and OPERATING INSTRUCTIONS FURNISHED. Once you see the DYNAMIC in operation you won't want to be without it. Its simplicity will amaze you. In a year the DYNAMIC only costs you about 7c a day. Comes complete ready to operate with helmet, rods, cable, holder, operating and welding instructions, etc.

SAVES YOU VALUABLE TIME AND MONEY

This portable, industrial transformer type DYNAMIC WELDER easily carried right to the job can be operated from any convenient properly wired 110 Volt 60 Cycle Line.

WORKS ON IRON, STEEL, BRASS, BRONZE AND OTHER METALS

Has 8 metallic and carbon arc heat stages. Does work you would think only possible with a larger more expensive machine . . . CAN ALSO BE SUPPLIED FOR 220 VOLT 60 CYCLE OPERATION and other voltages and cycles at slight additional cost.

DYNAMIC WELDER CO., 13 East 23rd Street, SR, Chicago 16, Ill.

MAIL COUPON FOR FREE DETAILS

10-DAY TRIAL OFFER

DYNAMIC WELDER CO.
13 EAST 23rd STREET, SR, CHICAGO 16, ILL.
Send me free details of your 10-DAY TRIAL OFFER.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

The best *Christmas Present* I ever got

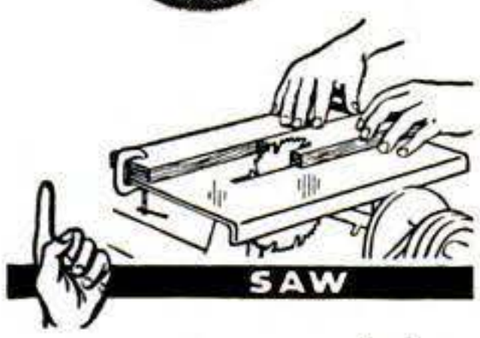
GIVE AN *EMRICK*—ASK FOR AN *EMRICK*

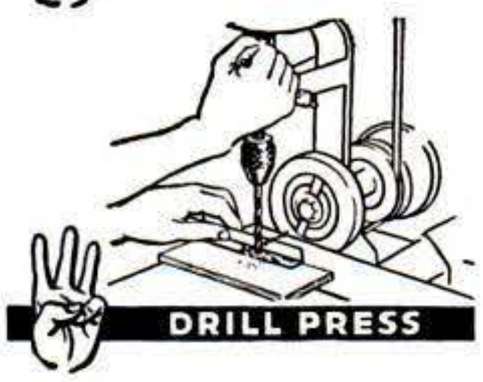
HERE'S WHY: 5 MOST USED POWER TOOLS IN 1 RUGGED UNIT FOR ONLY $34.95

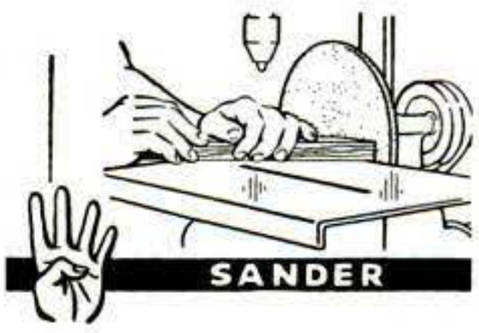
ONLY **$34.95**

Power tool fun and profit are built into the Emrick Universal Woodworker. Versatile. Rugged. Compact. Big capacity. Heavy—shipping weight 65 pounds. Drill press pulls ½" drill in steel. Saw uses 6" to 8" blade. Arbor also takes all standard accessory wheels such as wire brush and cloth buffer. Lathe turns pieces 30" long by 10" dia. Disc sander 8" dia. 5" grinder. Heavy replaceable bronze bearings at all wear points. Only $34.95 because sold direct from factory to you. MONEY BACK GUARANTEE. Order early for prompt shipment.

Complete except for motor and saw blade.







SEND THIS COUPON NOW!

EMRICK, Inc. 1761 Clinton Street Kalamazoo 24, Mich.

☐ Ship on 10 Days Trial.
☐ I am enclosing $17.50, balance C.O.D. ☐ Send free literature.

Name_____
Address_____
City_____ State_____

Copyrighted material

PRECISION MICROSCOPE

for only $29.50

• We've seen good microscopes in our many years of business—but this is the finest instrument we have ever offered for less than $100.00. Only American production genius and optical skill could design and build a precision compound microscope to sell for the amazingly low price of $29.50.

Check these features:

- **Magnification in any range from 65 to 200 diameters**
- **2 achromatic objectives with unusually high resolving power**
- **Adjustable, high quality eye piece**
- **Optically ground lenses which produce a wide, flat field without distortion**
- **Rack and pinion adjustment provides precise focusing movement**
- **Optical glass, high quality concave mirror with special swivel provides adequate illumination**
- **Rigidly supported stage**
- **Stand tilts for comfortable, easy desk or table work**

Microscopy is a hobby the whole family can enjoy—it's exciting, educational and entertaining. Order one of these fine microscopes today for your own use or as a gift for the youngsters.

Instruction manual giving complete information on microscopy furnished free with each instrument

A. DAIGGER & CO.

Serving laboratories for over 53 years

159 W. Kinzie St. Chicago 10, Illinois

. . . 8mm Sale . . .

6 PICTURES FOR THE PRICE OF ONE

Let's See Hollywood.....50 ft.
Earl Carrolls of Hollywood....50 ft.
Mexico City.....50 ft.
Ice Capades.....50 ft.
Bull Fights.....50 ft.
Old Time Fights.....50 ft.

ALL FOR $5.00

In California add Sales Tax

300 feet in all—It's A Buy—Don't Miss This Special Offer!

HOLLYWOOD CINE FILM

1715 N. Mariposa Ave. Hollywood 27, Calif.

CUTTING TOOLS

A catalog of cutting tools and supplies made available for the first time—is yours for the asking. Hard-to-get cutting tools and supplies—hundreds of them—are in our available stock. Send 35c and receive this wonderful catalog immediately by return mail. 8 pages.

Write **EASTERN TOOL & SUPPLY COMPANY**
176 Grand Street, New York 12, N. Y.
Canal 6-3749

U. S. SURPLUS
BARGAIN

POLAROID GOGGLES

Brand new! In original packing. Each with three interchangeable lenses.

SHOCK PROOF FRAME—SHATTERPROOF LENSES

Use them for all outdoors sports, beach, motoring, boating—anything. Heavy windproof sponge rubber ventilated frame with snap button lens retainers! Adj. elastic head band. Red, green, amber flexible shatterproof lenses, all instantly interchangeable. They won't last long at this price—it's smart to buy an extra. Post paid in U.S.A.

$1.00 POST PAID

GROBAN SUPPLY CO., Dept. PS 11
1522 S. Michigan Ave., Chicago 5, Ill.

AMERICA'S LOWEST PRICED

BAND SAW

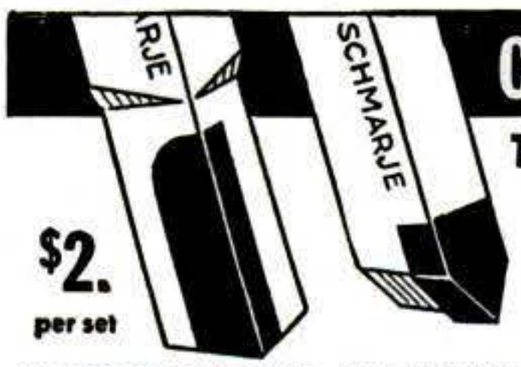
Now $16.95 Postpaid

ENGINEERING FEATURES FOUND ONLY IN HIGHEST PRICED MACHINES

Practical, modern design; new improved model. Accurate, smooth operation. Cuts to center of large 14" circle, 2½" thick. Genuine "Oilite" bearings adjustable ball-bearing blade guide. Upper wheel blade-tension adjustment; safe, fully enclosed mechanism. Thoroughly proved construction, ruggedly designed with sturdy laminated plywood. Stands 24" overall. As illustrated—blade included. **Immediate Delivery!** See your dealer or send only $16.95, and we'll pay shipping charges. Or, if you prefer, will forward C.O.D. **Absolute Money-Back Guarantee.**

SEE YOUR DEALER or write Dept. 104

SERRO MFG. CO. 1933 Olive St. St. Louis 3, Mo.



CARBOLOY-TIPPED

Tools for Wood, Metal, Plastic

Same high quality as used by the big factories. Long-life, high production—a pleasure to use. Performs perfectly on wood, metal, and plastic. In pairs as shown—either 1/4 or 5/16". Cash with order, postpaid. Ask for free catalog.

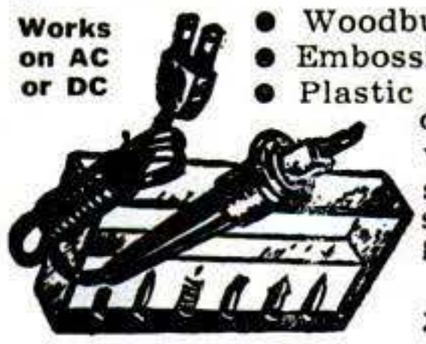
$2. per set

SCHMARJE TOOL & ENGINEERING CO., MUSCATINE, IOWA

WOODBURNING PEN

WITH 6 SPECIAL TIPS!

Works on AC or DC



• Woodburning • Foil Writing
• Embossing • Leather Burning
• Plastic Forming • Cork Decorating

With 6 colored foil sheets & instruction sheet. Unconditionally guaranteed.

$2.95

Postpaid or C.O.D. plus P.O. Charges

S. S. MERCHANDISE CO. Dept. 83
23 Flatbush Ave. Brooklyn, 17, N. Y.

SEALED POWER PISTON RINGS

save oil, save gas, restore original power

Send postal for free booklet on oil-saving.

SEALED POWER CORP., DEPT. H6, MUSKEGON, MICH.

WOOD SHAPERS

"DEAN" 3 Popular sizes, Homecraft and Industrial models. Table or bench model. Machined gray iron table, adjustable spindle. At your dealer or write direct

SYLACAUGA MACHINE AND TOOL WORKS

Box 506 Sylacauga, Alabama

New WIRELESS RECORD PLAYER

Converts Any Radio into an Automatic Radio Phonograph!

No Wires or Connections to Radio!

Amazing new WIRELESS AUTOMATIC RECORD PLAYER converts any standard radio, regardless of age, size or type into an automatic rdio phonograph combination. **No wires or connections to be made to radio.** Plays over any number of radios at same time!

Detrola record changer plays 12 ten-inch records or 10 twelve-inch records automatically. All you have to do is plug in record player in any electric outlet—turn on radio—dial "90" and the records play right through the loud speaker of your radio or any radio within 200 feet. Operates on 110 volts alternating current.

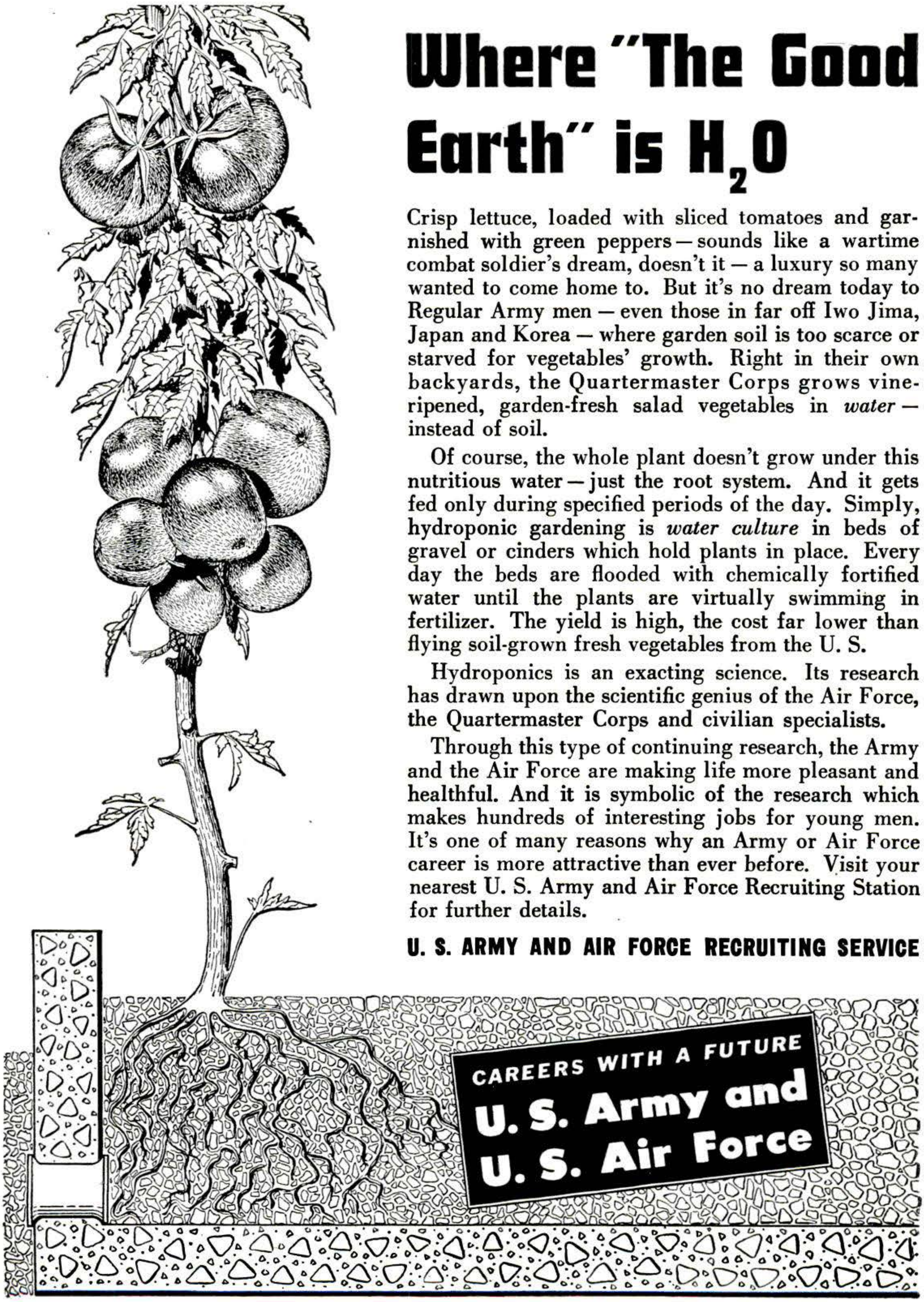
Wonderful Xmas gift for entire family. Send your order today. Shipped express freight collect. (Approx. 10 lbs.)

ONLY $29.50

Dealers: Write for information—Immediate Delivery.

ELECTRONICS LABS.; 1436 Laurel St., St. Louis 12, Mo.

Copyrighted material



Where "The Good Earth" is H_2O

Crisp lettuce, loaded with sliced tomatoes and garnished with green peppers — sounds like a wartime combat soldier's dream, doesn't it — a luxury so many wanted to come home to. But it's no dream today to Regular Army men — even those in far off Iwo Jima, Japan and Korea — where garden soil is too scarce or starved for vegetables' growth. Right in their own backyards, the Quartermaster Corps grows vine-ripened, garden-fresh salad vegetables in *water* — instead of soil.

Of course, the whole plant doesn't grow under this nutritious water — just the root system. And it gets fed only during specified periods of the day. Simply, hydroponic gardening is *water culture* in beds of gravel or cinders which hold plants in place. Every day the beds are flooded with chemically fortified water until the plants are virtually swimming in fertilizer. The yield is high, the cost far lower than flying soil-grown fresh vegetables from the U. S.

Hydroponics is an exacting science. Its research has drawn upon the scientific genius of the Air Force, the Quartermaster Corps and civilian specialists.

Through this type of continuing research, the Army and the Air Force are making life more pleasant and healthful. And it is symbolic of the research which makes hundreds of interesting jobs for young men. It's one of many reasons why an Army or Air Force career is more attractive than ever before. Visit your nearest U. S. Army and Air Force Recruiting Station for further details.

U. S. ARMY AND AIR FORCE RECRUITING SERVICE

Your Army and Air Force Serve the Nation and Mankind in War and Peace

Copyrighted material

SOUTH BEND LATHES

PRECISION-BUILT FOR PRECISION WORK

The precision with which South Bend Lathes are built insures precision machining under all conditions. Regardless of the type of machining—between-centers, collet, fixture, or chucking—a high degree of accuracy can be maintained. The precision of South Bend Lathes will give you better results on any kind of work.

There is a South Bend Lathe for every size and type of shop. They are made with 9", 10", 13", 14½", 16", and 16/24" swings.

SOUTH BEND LATHE WORKS

Building Better Lathes Since 1906

456 EAST MADISON STREET • SOUTH BEND 22, INDIANA

REG. U.S. PAT. OFF. & OTHER COUNTRIES

PROMPT DELIVERY

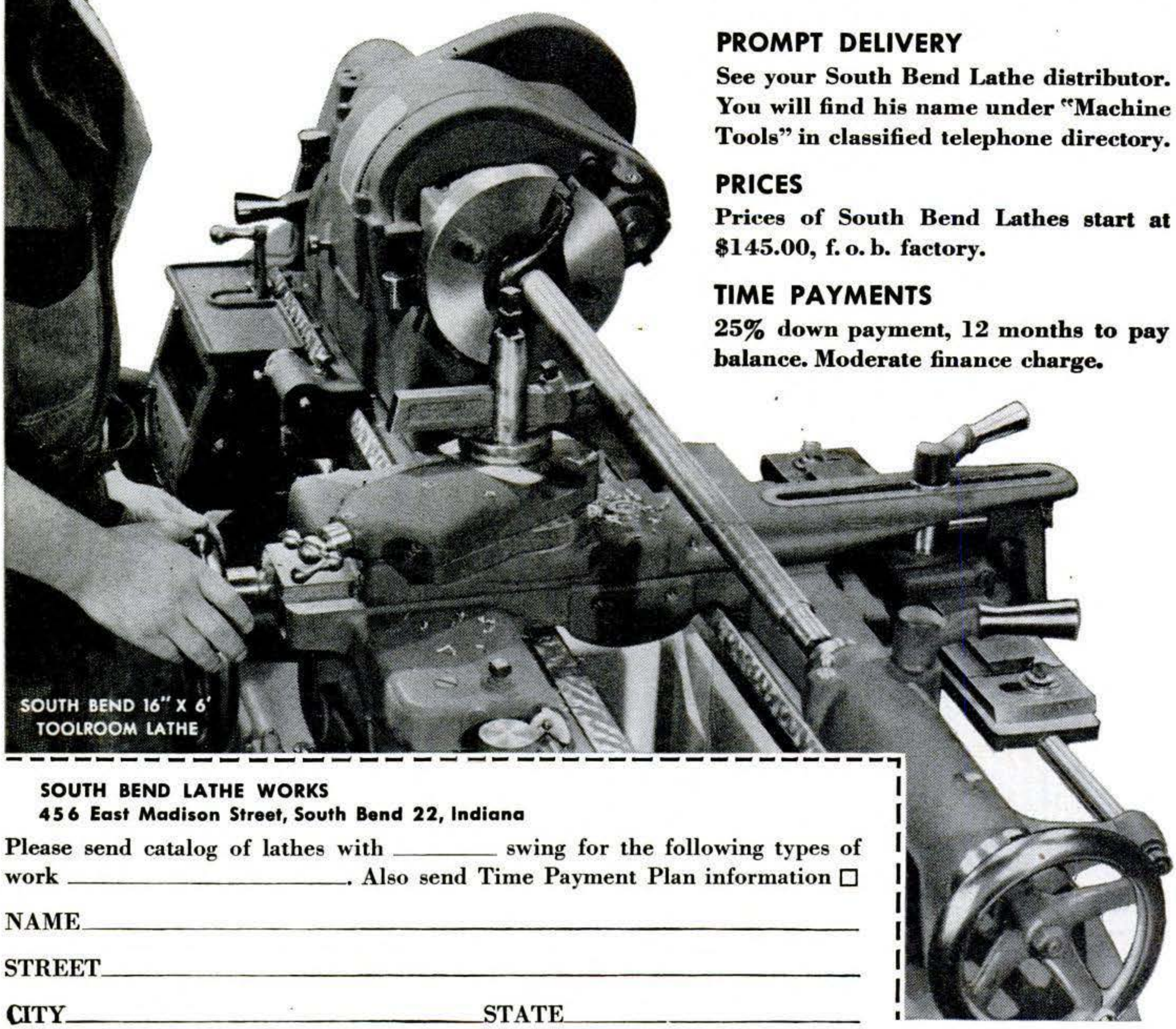
See your South Bend Lathe distributor. You will find his name under "Machine Tools" in classified telephone directory.

PRICES

Prices of South Bend Lathes start at $145.00, f. o. b. factory.

TIME PAYMENTS

25% down payment, 12 months to pay balance. Moderate finance charge.



SOUTH BEND 16" X 6' TOOLROOM LATHE

SOUTH BEND LATHE WORKS
456 East Madison Street, South Bend 22, Indiana

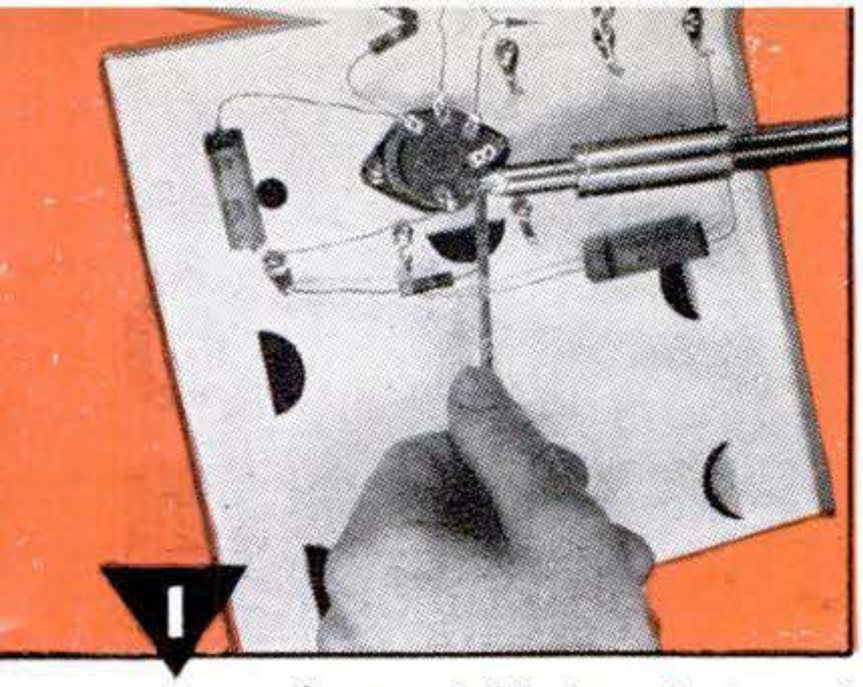
Please send catalog of lathes with _____ swing for the following types of work _____. Also send Time Payment Plan information ☐

NAME _____

STREET _____

CITY _____ STATE _____

Copyrighted material



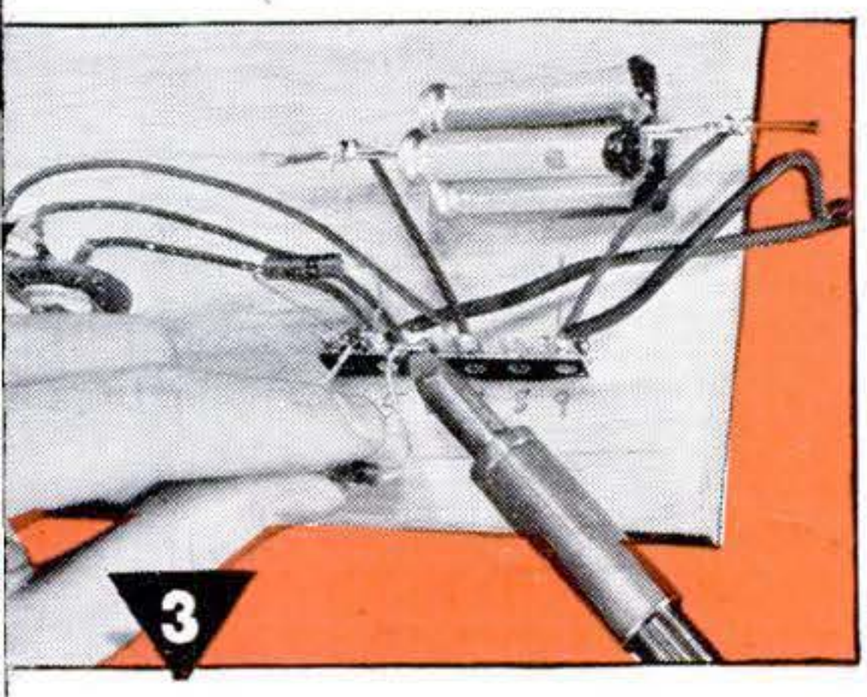
I send you Soldering Equipment and Radio Parts; show you how to do Radio Soldering; how to mount and connect Radio parts; give you practical experience.

Early in my course I show you how to build this N. R. I. Tester with parts I send. It soon helps you fix neighborhood Radios and earn EXTRA money in spare time.

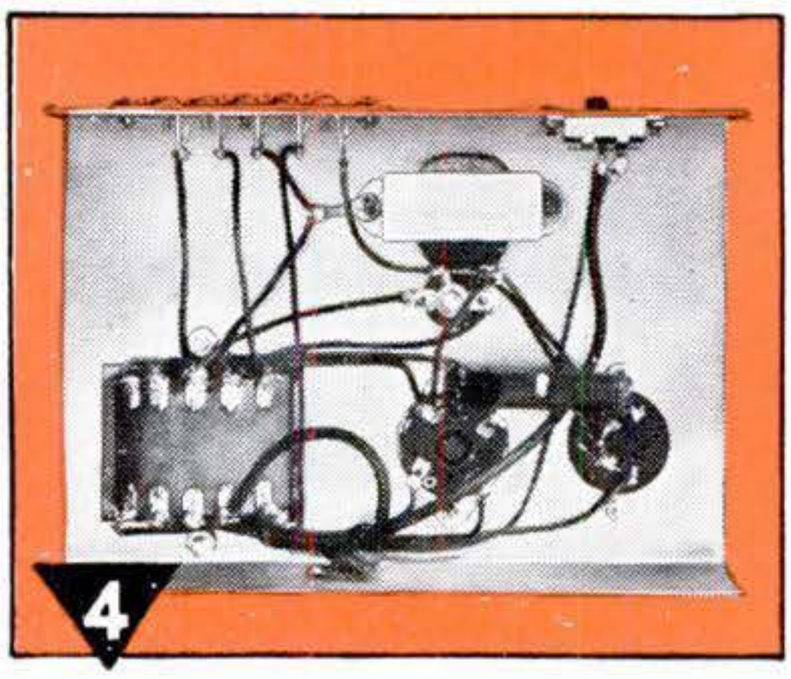
VETERANS

You can get this training in your own home under G. I. Bill. Mail coupon for full details.

Learn RA
by PRACTICING in



You get parts to build Radio Circuits; then test them; see how they work; learn how to design special circuits; how to locate and repair circuit defects.



You get parts to build this Vacuum Tube Power Pack, make changes which give you experience with packs of many kinds; learn to correct power pack troubles.

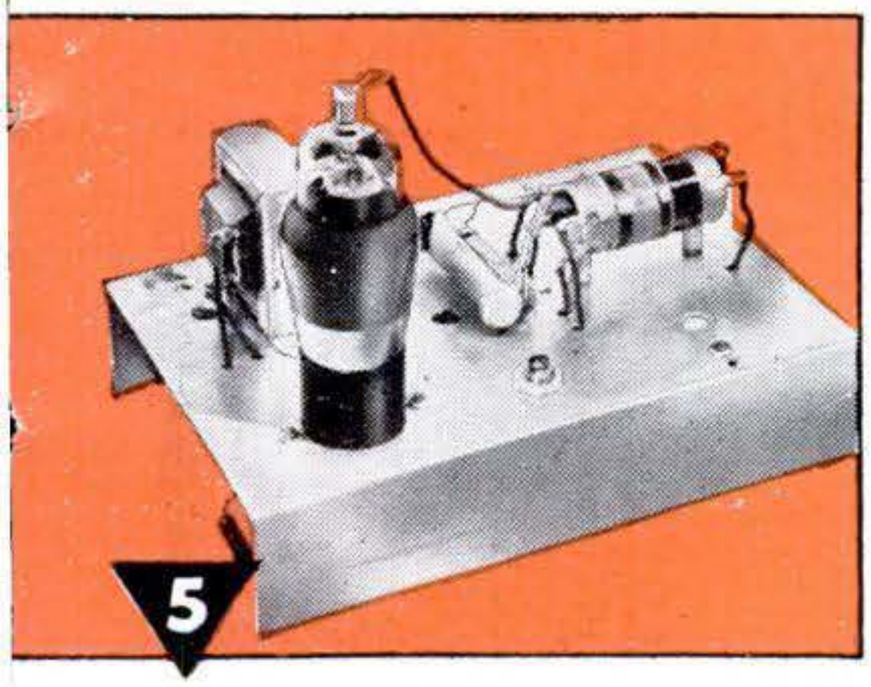
with BIG KITS of RADIO PARTS I send you

Do you want a good-pay job in the fast-growing Radio Industry—or your own Radio Shop? Mail post card at right for a Sample Lesson and my 64-page book, "How to Be a Success in RADIO," both FREE. See how I will train you at home—how you get practical Radio experience building, testing Radio circuits with BIG KITS OF PARTS I send.

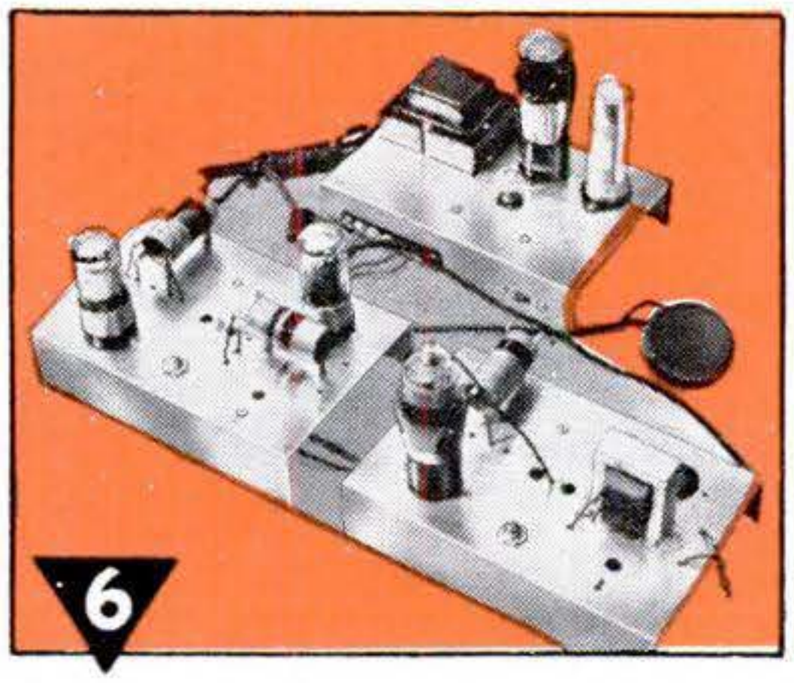
Many Beginners Soon Make Extra Money in Spare Time While Learning

The day you enroll I start sending EXTRA MONEY manuals that show you how to make EXTRA money fixing neighbors' Radios in spare time while still learning! It's probably easier to get started in Radio now than ever before, because the Radio Repair Business is booming. Think of even *greater* opportunities as Television, FM, and Electronic devices become available to the public! Cut out and mail post card for FREE books now!

Mail post card for Sample Lesson and FREE 64-page book. Read details about my Course; letters from men I trained; see how quickly, easily you can get started. No obligation! Just MAIL POST CARD NOW! **J. E. SMITH, President, Dept. 7MP3, National Radio Institute,** *Pioneer Home Study Radio School,* **Washington 9, D. C.**



Building this A. M. Signal Generator gives you more valuable experience. It provides amplitude-modulated signals for many tests and experiments.



You build this Superheterodyne Receiver which brings in local and distant stations—and gives you more experience to help you win success in Radio.

FIGHTS 5-FOOT DRIFTS IN EMERGENCY CALL

Patient rushed to hospital despite year's worst blizzard

When safety's a must ... it's "Prestone"!

ANTI-FREEZE

"Driving an ambulance is always 'emergency.' I can't take chances on freeze-ups—I always use 'Prestone' anti-freeze!"

Chester Raffio

In your car too!

NO RUST...
NO FOAM...
NO FREEZE...
NO FAILURE...

One shot lasts all winter!

IF YOU drove an ambulance... if lives depended on *you*...*you* wouldn't have to be reminded that "Prestone" is *the* anti-freeze for your radiator.

The weather can shoot up or plunge down—"Prestone" brand anti-freeze won't boil away... you're safe and *you know it!* That peace of mind alone would be worth a higher price, but *the price has not gone up!* It's still the same as *before* the war!

SAME PREWAR PRICE

1926...~~$6.00~~	1933...~~$2.95~~
1929...~~$5.00~~	1935...~~$2.70~~
1932...~~$4.45~~	1939...$2.65

1947...$2.65 PER GALLON

NATIONAL CARBON COMPANY, INC.
30 East 42nd Street
New York 17, N. Y.
Unit of Union Carbide and Carbon Corporation
UCC

PRESTONE Anti-Freeze

TRADE-MARK

The registered trade-marks "Eveready" and "Prestone" distinguish products of National Carbon Company, Inc.